(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(71) Applicants (for all designated States except US): GENE LOGIC, INC. [US/US]; 708 Quince Orchard Road, Gaithersburg, MD 20878 (US). LG BIOMEDICAL INSTITUTE [US/US]; Suite 101, 3252 Holiday Court, La Jolla, CA 92037 (US).

(72) Inventors; and
(75) Inventors/Applicants (for US only): KOH, Sang, Seok [KR/US]; Suite 101, 3252 Holiday Court, La Jolla, CA 92037 (US). LIU, Qing [CN/US]; 708 Quince Orchard Road, Gaithersburg, MD 20878 (US). CHUNG, Hyun-Ho [KR/US]; Suite 101, 3252 Holiday Court, La Jolla, CA 92037 (US). ZENG, Wen [CN/US]; 708 Quince Orchard Road, Gaithersburg, MD 20878 (US). LEE, Bogman [KR/US]; Suite 101, 3252 Holiday Court, La Jolla, CA 92037 (US). YERAMILLI, Subrahmanyam [US/US]; 708 Quince Orchard Road, Gaithersburg, MD 20878 (US). SONG, Si, Young [KR/KR]; 111-401 Samsung Apt., Baegma-maeul, Madu 1-dong, ilsan-gu, Goyang-si, Gyeonggi-do 411-351 (KR).

(74) Agents: TUSCAN, Michael, S. et al.; Morgan, Lewis & Bockius LLP, 1111 Pennsylvania Avenue NW, Washington, DC 20004 (US).

(54) Title: GENE EXPRESSION PROFILES IN LIVER DISEASE

(57) Abstract: The present invention results from the examination of tissue from hepatic carcinomas to identify genes differentially expressed between cancerous liver tissue and diseased but non-cancerous liver tissue. The invention includes diagnostic, screening, drug design and therapeutic methods using these genes, as well as solid supports comprising oligonucleotide arrays that are complementary to or hybridize to the differentially expressed genes.

GENE EXPRESSION PROFILES IN LIVER DISEASE

INVENTORS: Sang Seok KOH, Qing LIU, Hyun-Ho CHUNG, Wen ZENG, Bogman
LEE, Subrahmanyam YERRAMILLI, Si Young SONG

RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Applications 60/341,815
and 60/343,185, both of which are herein incorporated by reference in their entirety.

FIELD OF THE INVENTION

The invention relates generally to the changes in gene expression in liver tissue
from patients with hepatic carcinomas. The invention specifically relates to a set of
human genes that are differentially expressed in cancerous liver tissue compared to
diseased, but non-cancerous liver tissue.

BACKGROUND OF THE INVENTION

Liver Disease

Generally, liver disease is classified as a disorder that causes the liver to
malfunction or cease functioning all together. Cirrhosis, for example, is a group of
chronic liver diseases in which liver cells are damaged and then replaced with scar tissue,
thereby decreasing the amount of normal liver tissue. While it is most often caused by
alcohol abuse, patients with hepatitis infections and other biliary diseases can also develop
cirrhosis. Chronic hepatitis-B infection, hepatitis-C infection, and cirrhosis have all been
shown to have strong associations with primary liver cancer, although the mechanisms
involved are still not fully understood (Wu *et al.* (2001), *Oncogene*, 20: 3674-3682).
About 10-20% chronic hepatitis-B infections result in primary liver cancer. Other factors
such as alcohol consumption, poor nutrition and aflatoxins (carcinogens produced by
molds, which are found in spoiled foods such as peanuts, corn, grains and seeds) are also
linked to the development of primary liver cancer and cirrhosis.

In primary liver cancer, liver cells become abnormal, grow out of control and form
malignant tumors. This disease is also called hepatocellular carcinoma (HCC) or
malignant hepatoma. Cancer that spreads to the liver from another part of the body as a
result of metastasis is not the same disease. HCC is difficult to detect at an early stage
because the symptoms are not specific. They include loss of appetite and weight, fever,

fatigue and weakness. As the cancer progresses, pain may develop in the upper abdomen, extending to the back and right shoulder. Swelling or a palpable mass may also be present in the upper abdomen, along with jaundice and darkened urine. When the cancer metastasizes, it typically targets the lungs and brain.

5   Diagnosis of HCC may be made by blood tests, in particular, tests for tumor markers such as alpha-fetoprotein. About 50-70% of HCC patients show elevated levels of alpha-fetoprotein. Additional diagnostic methods include non-radioactive imaging (abdominal or chest x-rays, angiograms, CT scans and MRIs), liver scans using radioactive materials and liver biopsies. Treatment of HCC is often not successful,

10   because detection is often too late, but methods include surgical removal of the cancer, chemotherapy and radiation, alone or in combination. Although HCC is not very common in the United States, it is very prevalent in parts of Asia and Africa, largely due to the higher incidence of infection with hepatitis viruses (http://cis.nci.nih.gov/; http://cancer.med.upenn.edu/disease/liver/intro_liver.html).

15   The number of new cases of acute and chronic viral hepatitis has been estimated at approximately 200,000 per year in the United States. The viruses that commonly cause hepatitis are hepatitis A, hepatitis B (which is also oncogenic), hepatitis D (or delta hepatitis, a "defective" RNA virus that is infective only in the presence of hepatitis B virus), hepatitis C, hepatitis E (or epidemic non-A non-B hepatitis), hepatitis F and G

20   (epidemic non-A non-B non-C variants which may be mutants of hepatitis B, but which do not express the B antigens), cytomegalovirus, Epstein-Barr virus and herpes simplex virus. The last three are prominent in patients receiving immunosuppressive treatments following liver, kidney or bone marrow transplants. Hepatitis viruses B, C and D are typically associated with chronic viral hepatitis.

25   Among hepatitis viruses, hepatitis B is associated with the greatest mortality. This virus is a double-shelled DNA virus with an endogenous DNA polymerase and a single, circular molecule of DNA 3200 base pairs in length. The virus replicates via an RNA intermediate requiring reverse transcriptase. In patients infected with hepatitis B, three types of particles can be detected in the serum, 20 nm spheres, tubules 20 nm in diameter

30   and 100 nm in length, and complex, 42 nm Dane particles. Similar to the human hepatitis B virus are hepatitis B viruses found in ducks, herons, squirrels and woodchucks.

Diagnosis of hepatitis B is usually made by finding the surface antigen (HBsAg) in serum. The presence of HBsAg for six months or more signifies a carrier state or chronic infection. Anti-HBs (HBsAb) accounts for recovery and immunity.

Although the core antigen (HBcAg) is not detectable in the blood, the antibody can
5   be detected. In cases of acute hepatitis, an IgM antibody to the core antigen (HBcAg) is found. But, if this antibody persists, it is an indication of chronic viral hepatitis. Another indication of chronic infection is a high level of IgG HBcAb, without HBsAb, but with HBsAg.

HBeAg correlates with active viral synthesis and infectivity. Appearance of the
10   antibody (HBeAb) is a sign of reduced infectivity and that the patient will recover.

Only about 2-8% of adults infected with hepatitis B develop chronic infection, but about 90% of infected neonates become carriers. Chronic hepatitis B infection is associated with cirrhosis, as well as with liver carcinomas, as about 25% of these patients eventually develop cirrhosis. Although there is no universally effective treatment for
15   either chronic or acute hepatitis B infection, current treatment methods involve administration of interferon alpha-2a, at dosages of, *e.g.*, 10 million units 3 times a week for 16 weeks, or 5 million units daily for 4 months.

Hepatitis C virus is considered to be the major cause of post-transfusion hepatitis. Another important source of infection is intravenous drug use. This virus is classified in
20   the togavirus family of lipid envelope viruses, producing particles of 30-60 nm. It is a single-stranded RNA virus with a genome of about 10.5 kb. About 50% of patients infected with hepatitis C develop chronic infections, and about 20% of patients chronically infected develop cirrhosis. As mentioned above, it has been noted that many hepatitis C patients go on to develop liver cancer, but the percentage has not yet been established.
25   Efforts at treating hepatitis C have been frustrated by the results that current antivirals, including alpha interferon, have not been very effective (http://www.arens.com/brian/viral.htm).

Cirrhosis of the liver, typically caused by toxins, inflammation or metabolic disorders, is characterized by widespread nodules combined with fibrosis. Damaged or
30   dead liver cells are replaced by fibrous scar tissue, which to leads to fibrosis. Liver cells regenerate in an abnormal pattern, producing nodules surrounded by fibrous tissue. The fibrosis and nodule formation cause distortion and blockage of the liver's structural components, causing impaired blood flow and biochemical function.

4

In the circulatory system, blood from the intestines and spleen flows to the liver via the portal vein, before returning to the heart via the hepatic vein. Blood also flows directly to the liver from the hepatic artery. In the esophagus, stomach, small intestine and rectum, the body's systemic circulation is connected to the liver's portal circulation, and, under
5   normal conditions, there is no backflow from the portal circulation into the systemic circulation. In cirrhosis, however, the fibrous scar tissue decreases blood flow to and through the liver. Blood then backs up in the portal vein and portal circulation, causing complications in other organs, such as enlargement of the spleen with sequestered blood cells, reduced platelet count and abnormal bleeding. Backflow of blood into the systemic
10   circulation can cause varicose veins in the esophagus, stomach and rectum, which can rupture and bleed profusely. Hypertension in the portal circulation can also produce fluid accumulation in the abdomen (ascites) and surrounding tissue (peripheral edema), while decreased bilirubin secretion can lead to elevated levels of bilirubin in the blood and jaundice. Abnormal biochemical changes due to cirrhosis include decreased levels of
15   albumin (which aggravates the ascites and edema), decreased levels of clotting factors, gynecomastia in men (impaired estrogen metabolism), and decreased metabolism of sugars, triglycerides and cholesterol. In advanced stages of cirrhosis, abnormalities in the brain can occur, because toxic substances normally removed by the liver flow to the brain. Changes include decreased mental function (concentration and cognitive abilities), stupor,
20   coma, brain swelling and death.

In patients displaying some of the above symptoms, diagnosis of cirrhosis is usually easy, but cirrhosis may be difficult to detect in its early stages. Subtle changes occurring in the early stages include red palms, red spots on the upper body that blanch, hypertrophy of the parotid glands, fibrosis of the tendons in the palms and gynecomastia.
25   X-rays and radioactive tracer tests may be effective, but diagnosis must often be by liver biopsy.

The structural damage to the liver is irreversible, although the underlying causes may be treated to stop progression of the disease (alcoholism in particular). The sequelae of the disease may also be treated (such varicose veins, ascites and edema). In alcoholics
30   who have stopped drinking for extended periods of time, liver transplants have been successful (http://cpmcnet.columbia.edu/dept/gi/cirrhosis.html).

Molecular Changes in Liver Disease

5

Little is known about the molecular changes in liver cells associated with the development and progression of liver disease. Accordingly, there exists a need for the investigation of the changes in global gene expression levels as well as the need for the identification of new molecular markers associated with the development and progression
5   of liver disease. Furthermore, if intervention is expected to be successful in halting or slowing down liver disease, means of accurately assessing the early manifestations of liver disease need to be established. One way to accurately assess the early manifestations of liver disease is to identify markers which are uniquely associated with disease progression (see for example Kim *et al.* (2001) *Oncogene* 20: 4568-4575). Likewise, the development
10   of therapeutics to prevent or stop the progression of liver disease relies on the identification of genes responsible for the cancerous transformation of liver cells and the growth of cancerous liver cells.

To date, researchers have been able to identify a few genetic alterations believed to underlie tumor development. These genetic alterations include amplification of oncogenes
15   and mutations that result in the loss of tumor suppressor genes. Tumor suppressor genes are genes that, in their wild-type alleles, express proteins that suppress abnormal cellular proliferation. When the gene coding for a tumor suppressor protein is mutated or deleted, the resulting mutant protein or the complete lack of tumor suppressor protein expression may fail to correctly regulate cellular proliferation, and abnormal proliferation may take
20   place, particularly if there is already existing damage to the cellular regulatory mechanism. A number of well-studied human tumors and tumor cell lines have missing or non-functional tumor suppressor genes. Examples of tumor suppressor genes include, but are not limited to, the retinoblastoma susceptibility gene or RB gene, the p53 gene, the deletion in colon carcinoma (DCC) gene and the neurofibromatosis type 1 (NF-1) tumor
25   suppressor gene (Weinberg, R. A. Science, 1991, 254:1138-1146). Loss of function or inactivation of tumor suppressor genes may play a central role in the initiation and/or progression of a significant number of human cancers.

Classification of heterogeneous populations of tumor types is a daunting task; yet, initial studies utilizing gene expression patterns to identify subtypes of cancer
30   produced rather intriguing results (see Perou *et al.*, *Proc Natl Acad Sci U S A* 96:9212-9217, 1999; Golub *et al.*, *Science* 286:531-537, 1999; Alizadeh *et al.*, *Nature* 403:503-511, 2000; Alon *et al. Proc Natl Acad Sci U S A* 96:6745-6750, 1999; and Bittner *et al.*, *Nature* 406:536-540, 2000). Molecular classification of B-cell lymphoma by gene

6

expression profiling elucidated clinically distinct diffuse large-B-cell lymphoma subgroups (see Alizadeh *supra*). Stratification of patients based on their distinctive gene expression profiles may allow researchers to precisely group similar patient populations for evaluating chemotherapeutic agents. The more homogenous population of patients

5   decreases the variability of patient-to-patient responses leading to the development of agents capable of eradicating specific subtypes of cancers previously unknown using standard classification techniques.

The utilization of gene expression profiles to classify tumors, to identify drug targets, to identify diagnostic markers and/or to gain further insights into the consequences

10 of chemotherapeutic treatments could facilitate the design of more efficacious patient-specific stratagems for treating a variety of cancers. In breast cancer, studies utilizing limited numbers of genes (8,102 genes) have classified tumors into subtypes based on gene expression profiles, and this study indicated a diversity of molecular phenotypes associated with breast tumors (Perou *et al.*, *Nature* 406:747-752, 2000). The advent of

15 cDNA and oligonucleotide arrays has enabled researchers to map tissue-specific expression levels for thousands of genes (Alon *et al.*, *Proc Natl Acad Sci USA* 96:6745-6750, 1999; Iyer *et al.*, Science 283:83-87, 1999; Khan *et al.*, *Cancer Res* 58:5009-5013, 1998; Lee *et al.*, *Science* 285:1390-1393, 1999; Wang *et al.*, *Gene* 229:101-108, 1999; Whitney *et al.*, *Ann Neurol* 46:425-428, 1999). The study by Martin *et al.* (*Cancer Res*

20 60:2232-2238, 2000) used a custom microarray composed of 124 genes discovered by differential display associated with either normal breast epithelial cells or from the MDA-MB-435 malignant breast tumor cell line. Using the custom microarray, researchers examined the relationship between expression patterns discovered by clustering a number of genes with clinical stages of breast cancer indicating that gene expression patterns were

25 capable of grouping breast tumors into distinct categories (Martin *et al.*, *supra*).

Although these studies have demonstrated that expression profiling may be used to produce improvements in diagnosis of human diseases such as cancer, as well as in the development of improved therapeutic strategies, further studies are needed. Accordingly, there remains a need in the art for materials and methods that permit a more accurate

30 diagnosis of hepatic carcinomas, as well as of other chronic liver diseases. In addition, there remains a need in the art for methods to treat and methods to identify agents that can effectively treat liver disease. The present invention meets these and other needs.

SUMMARY OF THE INVENTION

The present invention is based on the discovery of the genes and their expression profiles associated with various types and stages of liver disease, in particular hepatocellular carcinoma (HCC), chronic hepatitis (CH) and liver cirrhosis (LC).

The invention includes methods of diagnosing liver disease in a patient comprising the step of detecting the level of expression in a tissue sample of one or more genes from Table 1; wherein differential expression of the genes in Table 1 is indicative of liver disease. The invention also includes methods of detecting the progression of liver disease. For instance, methods of the invention include detecting the progression of liver disease in a patient comprising the step of detecting the level of expression in a tissue sample of one or more genes from Table 1; wherein differential expression of the genes in Table 1 is indicative of liver disease progression. In some preferred embodiments, PCA analysis based on all or a portion of the group of genes identified in Table 1 may be used to differentiate between the different stages of liver disease, such as in the metastasis of liver carcinomas. In some preferred embodiments, one or more genes may be selected from Table 1.

In some aspects, the present invention provides a method of monitoring the treatment of a patient with liver disease, comprising administering a pharmaceutical composition to the patient, preparing a gene expression profile from a cell or tissue sample from the patient and comparing the patient gene expression profile to a gene expression from a cell population comprising normal liver cells, or to a gene expression profile from a cell population comprising disease state liver cells, or to both. In some preferred embodiments, the gene profile will include the expression level of one or more genes in Table 1.

Another aspect of the present invention includes a method of treating a patient with liver disease, comprising administering to the patient a pharmaceutical composition, wherein the composition alters the expression of at least one gene in Table 1, preparing a gene expression profile from a cell or tissue sample from the patient comprising diseased cells and comparing the patient expression profile to a gene expression profile from an untreated cell population comprising disease state liver cells.

In another aspect, the present invention provides a method of detecting the progression of carcinogenesis in a patient, comprising detecting the level of expression in

8

a tissue sample of one or more genes from Table 1; wherein differential expression of the genes in Table 1 is indicative of hepatic carcinogenesis.

The invention further includes methods of screening for an agent capable of modulating the onset or progression of liver disease, comprising the steps of exposing a

5   cell to the agent; and detecting the expression level of one or more genes from Table 1. In some embodiments, the liver disease may be a hepatocellular carcinoma. In some preferred embodiments, one or more genes may be selected from a group consisting of those listed in Table 1. In some preferred methods, it may be desirable to detect all or nearly all of the genes in the tables.

10   The invention further includes compositions comprising at least two oligonucleotides, wherein each of the oligonucleotides comprises a sequence that specifically hybridizes to a gene in Table 1, as well as solid supports comprising at least two probes, wherein each of the probes comprises a sequence that specifically hybridizes to a gene in Table 1. In some preferred embodiments, one or more genes may be selected

15   from a group consisting of those listed in Table 1.

The invention further includes computer systems comprising a database containing information identifying the expression level in liver tissue of a set of genes comprising at least two genes in Table 1 and a user interface to view the information. In some preferred embodiments, one or more genes may be selected from a group consisting

20   of those listed in Table 1. The database may further include sequence information for the genes, information identifying the expression level for the set of genes in non-cancerous liver tissue and in cancerous liver tissue and may contain links to external databases such as GenBank.

Lastly, the invention includes methods of using the databases, such as methods of

25   using the disclosed computer systems to present information identifying the expression level in a tissue or cell of at least one gene in Table 1, comprising the step of comparing the expression level of at least one gene in Table 1 in the tissue or cell to the level of expression of the gene in the database. In some preferred embodiments, one or more genes may be selected from a group consisting of those listed in Table 1.

30   DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Many biological functions are accomplished by altering the expression of various genes through transcriptional (e.g., through control of initiation, provision of RNA

9

precursors, RNA processing, etc.) and/or translational control. For example, fundamental biological processes such as cell cycle, cell differentiation and cell death, are often characterized by the variations in the expression levels of groups of genes.

Changes in gene expression also are associated with pathogenesis. For example,
5   the lack of sufficient expression of functional tumor suppressor genes and/or the over expression of oncogene/protooncogenes could lead to tumorgenesis or hyperplastic growth of cells (Marshall, *Cell* 64:313-326, 1991; Weinberg, *Science*, 254:1138-1146, 1991). Thus, changes in the expression levels of particular genes (*e.g.*, oncogenes or tumor suppressors) serve as signposts for the presence and progression of various diseases.

10   Monitoring changes in gene expression may also provide certain advantages during drug screening and development. Often drugs are pre-screened for the ability to interact with a major target without regard to other effects the drugs have on cells. Often such other effects cause toxicity in the whole animal, which prevent the development and use of the potential drug.

15   Using pairs of samples from subjects, applicants have examined samples from diseased but non-cancerous liver tissue and from cancerous liver tissue to identify global changes in gene expression between tumor biopsies and surrounding non-cancerous tissue. Diseased but non-cancerous liver tissue was either inflamed tissue from chronic viral hepatitis patients or fibrotic tissue from liver cirrhosis patients. Non-cancerous tissue was
20   removed from a point in the liver adjacent to a tumor biopsy site. These global changes in gene expression, also referred to as expression profiles, provide useful markers for diagnostic uses as well as markers that can be used to monitor disease states, disease progression, drug toxicity, drug efficacy and drug metabolism.

The gene expression profiles described herein were derived from diseased liver
25   biopsy samples from Korean patients 34-65 years old. These patients had been diagnosed with chronic hepatitis or cirrhosis and, in each case, had subsequently developed liver cancer. The disease state associated with each sample is indicated in Table 2.

The present invention provides compositions and methods to detect the level of expression of genes that may be differentially expressed dependent upon the state of the
30   cell, *i.e.*, non-cancerous versus cancerous. These expression profiles of genes provide molecular tools for evaluating toxicity, drug efficacy, drug metabolism, development, and disease monitoring. Changes in the expression profile from a baseline profile can be used as an indication of such effects. Those skilled in the art can use any of a variety of known

10

techniques to evaluate the expression of one or more of the genes and/or gene fragments identified in the instant application in order to observe changes in the expression profile in a tissue or sample of interest.

Definitions

In the description that follows, numerous terms and phrases known to those skilled in the art are used. In the interest of clarity and consistency of interpretation, the definitions of certain terms and phrases are provided.

As used herein, the phrase "detecting the level of expression" includes methods that quantify expression levels as well as methods that determine whether a gene of interest is expressed at all. Thus, an assay which provides a yes or no result without necessarily providing quantification of an amount of expression is an assay that requires "detecting the level of expression" as that phrase is used herein.

As used herein, oligonucleotide sequences that are complementary to one or more of the genes described herein, refers to oligonucleotides that are capable of hybridizing under stringent conditions to at least part of the nucleotide sequence of said genes. Such hybridizable oligonucleotides will typically exhibit at least about 75% sequence identity at the nucleotide level to said genes, preferably about 80% or 85% sequence identity or more preferably about 90% or 95% or more nucleotide sequence identity to said genes.

"Bind(s) substantially" refers to complementary hybridization between a probe nucleic acid and a target nucleic acid and embraces minor mismatches that can be accommodated by reducing the stringency of the hybridization media to achieve the desired detection of the target polynucleotide sequence.

The terms "background" or "background signal intensity" refer to hybridization signals resulting from non-specific binding, or other interactions, between the labeled target nucleic acids and components of the oligonucleotide array (e.g., the oligonucleotide probes, control probes, the array substrate, etc.). Background signals may also be produced by intrinsic fluorescence of the array components themselves. A single background signal can be calculated for the entire array, or a different background signal may be calculated for each target nucleic acid. In a preferred embodiment, background is calculated as the average hybridization signal intensity for the lowest 5% to 10% of the probes in the array, or, where a different background signal is calculated for each target gene, for the lowest 5% to 10% of the probes for each gene. Of course, one of skill in the

11

art will appreciate that where the probes to a particular gene hybridize well and thus appear to be specifically binding to a target sequence, they should not be used in a background signal calculation. Alternatively, background may be calculated as the average hybridization signal intensity produced by hybridization to probes that are not complementary to any sequence found in the sample (e.g., probes directed to nucleic acids of the opposite sense or to genes not found in the sample such as bacterial genes where the sample is mammalian nucleic acids). Background can also be calculated as the average signal intensity produced by regions of the array that lack any probes at all.

The phrase "hybridizing specifically to" refers to the binding, duplexing or hybridizing of a molecule substantially to or only to a particular nucleotide sequence or sequences under stringent conditions when that sequence is present in a complex mixture (e.g., total cellular) DNA or RNA.

Assays and methods of the invention may utilize available formats to simultaneously screen at least about 100, preferably about 1000, more preferably about 10,000 and most preferably about 1,000,000 or more different nucleic acid hybridizations.

The terms "mismatch control" or "mismatch probe" refer to a probe whose sequence is deliberately selected not to be perfectly complementary to a particular target sequence. For each mismatch (MM) control in a high-density array there typically exists a corresponding perfect match (PM) probe that is perfectly complementary to the same particular target sequence. The mismatch may comprise one or more bases that are not complementary to the corresponding bases of the target sequence.

While the mismatch(s) may be located anywhere in the mismatch probe, terminal mismatches are less desirable as a terminal mismatch is less likely to prevent hybridization of the target sequence. In a particularly preferred embodiment, the mismatch is located at or near the center of the probe such that the mismatch is most likely to destabilize the duplex with the target sequence under the test hybridization conditions.

The term "perfect match probe" refers to a probe that has a sequence that is perfectly complementary to a particular target sequence. The test probe is typically perfectly complementary to a portion (subsequence) of the target sequence. The perfect match (PM) probe can be a "test probe", a "normalization control" probe, an expression level control probe and the like. A perfect match control or perfect match probe is, however, distinguished from a "mismatch control" or "mismatch probe."

12

As used herein a "probe" is defined as a nucleic acid, preferably an oligonucleotide, capable of binding to a target nucleic acid of complementary sequence through one or more types of chemical bonds, usually through complementary base pairing, usually through hydrogen bond formation. As used herein, a probe may include

5 natural (i.e., A, G, U, C or T) or modified bases (7-deazaguanosine, inosine, *etc.*). In addition, the bases in probes may be joined by a linkage other than a phosphodiester bond, so long as it does not interfere with hybridization. Thus, probes may be peptide nucleic acids in which the constituent bases are joined by peptide bonds rather than phosphodiester linkages.

10 The term "stringent conditions" refers to conditions under which a probe will hybridize to its target subsequence, but with only insubstantial hybridization to other sequences or to other sequences such that the difference may be identified. Stringent conditions are sequence-dependent and will be different in different circumstances. Longer sequences hybridize specifically at higher temperatures. Generally, stringent

15 conditions are selected to be about 5°C lower than the thermal melting point (Tm) for the specific sequence at a defined ionic strength and pH.

Typically, stringent conditions will be those in which the salt concentration is at least about 0.01 to 1.0 M sodium ion concentration (or other salts) at pH 7.0 to 8.3 and the temperature is at least about 30°C for short probes (e.g., 10 to 50 nucleotide). Stringent

20 conditions may also be achieved with the addition of destabilizing agents such as formamide.

The "percentage of sequence identity" or "sequence identity" is determined by comparing two optimally aligned sequences or subsequences over a comparison window or span, wherein the portion of the polynucleotide sequence in the comparison window

25 may optionally comprise additions or deletions (i.e., gaps) as compared to the reference sequence (which does not comprise additions or deletions) for optimal alignment of the two sequences. The percentage is calculated by determining the number of positions at which the identical subunit (e.g., nucleic acid base or amino acid residue) occurs in both sequences to yield the number of matched positions, dividing the number of matched

30 positions by the total number of positions in the window of comparison and multiplying the result by 100 to yield the percentage of sequence identity. Percentage sequence

13

identity when calculated using the programs GAP or BESTFIT (see below) is calculated using default gap weights.

Homology or identity may be determined by BLAST (Basic Local Alignment Search Tool) analysis using the algorithm employed by the programs blastp, blastn, blastx, tblastn and tblastx (Karlin *et al.*, *Proc Natl Acad Sci USA* 87:2264-2268, 1990 and Altschul, J Mol Evol 36:290-300, 1993, fully incorporated by reference) which are tailored for sequence similarity searching. The approach used by the BLAST program is to first consider similar segments between a query sequence and a database sequence, then to evaluate the statistical significance of all matches that are identified and finally to summarize only those matches which satisfy a preselected threshold of significance. For a discussion of basic issues in similarity searching of sequence databases, see Altschul *et al.*, (*Nature Genet* 6:119-129, 1994) which is fully incorporated by reference. The search parameters for histogram, descriptions, alignments, expect (i.e., the statistical significance threshold for reporting matches against database sequences), cutoff, matrix and filter are at the default settings. The default scoring matrix used by blastp, blastx, tblastn, and tblastx is the BLOSUM62 matrix (Henikoff *et al.*, *Proc Natl Acad Sci USA* 89:10915-10919, 1992, fully incorporated by reference). Four blastn parameters were adjusted as follows: Q=10 (gap creation penalty); R=10 (gap extension penalty); wink=1 (generates word hits at every wink[th] position along the query); and gapw=16 (sets the window width within which gapped alignments are generated). The equivalent Blastp parameter settings were Q=9; R=2; wink=1; and gapw=32. A Bestfit comparison between sequences, available in the GCG package version 10.0, uses DNA parameters GAP=50 (gap creation penalty) and LEN=3 (gap extension penalty) and the equivalent settings in protein comparisons are GAP=8 and LEN=2.

Uses of Differentially Expressed Genes

The present invention identifies those genes differentially expressed between cancerous and non-cancerous liver tissue. One of skill in the art can select one or more of the genes identified as being differentially expressed in Table 1 and use the information and methods provided herein to interrogate or test a particular sample. For a particular interrogation of two conditions or sources, it may be desirable to select those genes which display a great deal of difference in the expression pattern between the two conditions or sources. In other instances, it may be appropriate to select genes whose expression

14

changes only slightly between the two conditions. At least a 1.5-fold difference may be desirable, but a three-fold, five-fold or ten-fold difference may be preferred in some instances. The data are subjected to statistical evaluation to ensure that the observed differences and the disease association are statistically significant. Interrogations of the genes or proteins can be performed to yield different information.

Diagnostic Uses for the Liver Cancer Markers

As described herein, the genes and gene expression information provided in Table 1 may be used as diagnostic markers for the prediction or identification of a disease state of liver tissue. For instance, a liver tissue sample or other sample from a patient may be assayed by any of the methods known to those skilled in the art, and the expression levels from one or more genes from Table 1 may be compared to the expression levels found in non-cancerous liver tissue, cancerous liver tissue or both. Expression profiles generated from the tissue or other samples that substantially resemble an expression profile from non-cancerous or cancerous liver tissue may be used, for instance, to aid in disease diagnosis. Comparison of the expression data, as well as available sequence or other information, may be done by a researcher or diagnostician or may be done with the aid of a computer and databases as described herein.

Use of the Liver Cancer Markers for Monitoring Disease Progression

Molecular expression markers for liver disease can be used to confirm the type and progression of disease made on the basis of morphological criteria. For example, non-cancerous liver tissue could be distinguished from cancerous tissue based on the level and type of genes expressed in a tissue sample. In some situations, identifications of cell type or source is ambiguous based on classical criteria. In these situations, the molecular expression markers of the present invention are useful for identifying the region of the liver from which a sample came, as well as whether or not normal levels of gene expression have been altered (signs of metabolic disturbances).

In addition, progression of hepatic carcinoma to new areas of the liver can be monitored by following the expression patterns of the involved genes using the molecular expression markers of the present invention. Monitoring of the efficacy of certain drug regimens can also be accomplished by following the expression patterns of the molecular expression markers.

As described above, the genes and gene expression information provided in Table 1 may also be used as markers for the direct monitoring of disease progression, for instance, the development of liver cancer. A liver tissue sample or other sample from a patient may be assayed by any of the methods known to those of skill in the art, and the

5   expression levels in the sample from a gene or genes from Table 1 may be compared to the expression levels found in non-cancerous liver tissue, tissue from a hepatic carcinoma or both. Comparison of the expression data, as well as available sequence or other information may be done by a researcher or diagnostician or may be done with the aid of a computer and databases as described herein.

10

Use of the Liver Cancer Markers for Drug Screening

According to the present invention, potential drugs can be screened to determine if application of the drug alters the expression of one or more of the genes identified herein. This may be useful, for example, in determining whether a particular drug is

15   effective in treating a particular patient with liver disease. In the case where a gene's expression is affected by the potential drug such that its level of expression returns to normal, the drug is indicated in the treatment of liver cancer. Similarly, a drug which causes expression of a gene which is not normally expressed by healthy liver cells may be contra-indicated in the treatment of liver cancer.

20   According to the present invention, the genes identified in Table 1 may also be used as markers to evaluate the effects of a candidate drug or agent on a cell, particularly a cell undergoing malignant transformation, for instance, a liver cancer cell or tissue sample. A candidate drug or agent can be screened for the ability to stimulate the transcription or expression of a given marker or markers (drug targets) or to down-regulate

25   or inhibit the transcription or expression of a marker or markers. According to the present invention, one can also compare the specificity of a drug's effects by looking at the number of markers affected by the drug and comparing them to the number of markers affected by a different drug. A more specific drug will affect fewer transcriptional targets. Similar sets of markers identified for two drugs indicates a similarity of effects.

30   Assays to monitor the expression of a marker or markers as defined in Table 1 may utilize any available means of monitoring for changes in the expression level of the nucleic acids of the invention. As used herein, an agent is said to modulate the expression

16

of a nucleic acid of the invention if it is capable of up- or down-regulating expression of the nucleic acid in a cell.

Agents that are assayed in the above methods can be randomly selected or rationally selected or designed. As used herein, an agent is said to be randomly selected when the agent is chosen randomly without considering the specific sequences involved in the association of a protein of the invention alone or with its associated substrates, binding partners, etc. An example of randomly selected agents is the use a chemical library or a peptide combinatorial library, or a growth broth of an organism.

As used herein, an agent is said to be rationally selected or designed when the agent is chosen on a nonrandom basis which takes into account the sequence of the target site and/or its conformation in connection with the agents action. Agents can be selected or designed by utilizing the peptide sequences that make up these sites. For example, a rationally selected peptide agent can be a peptide whose amino acid sequence is identical to or a derivative of any functional consensus site.

The agents of the present invention can be, as examples, peptides, small chemical molecules, vitamin derivatives, as well as carbohydrates, lipids, oligonucleotides and covalent and non-covalent combinations thereof. Dominant negative proteins, DNA encoding these proteins, antibodies to these proteins, peptide fragments of these proteins or mimics of these proteins may be introduced into cells to affect function. "Mimic" as used herein refers to the modification of a region or several regions of a peptide molecule to provide a structure chemically different from the parent peptide but topographically and functionally similar to the parent peptide (see Grant, in Molecular Biology and Biotechnology, Meyers (ed.), VCH Publishers, 1995). A skilled artisan can readily recognize that there is no limit as to the structural nature of the agents of the present invention.

Use of the Liver Cancer Markers as Therapeutic Agents

Agents that up- or down-regulate or modulate the expression of the nucleic acid molecules of Table 1, or at least one activity of a protein encoded by the nucleic acid molecules of Table 1, such as agonists or antagonists, may be used to modulate biological and pathologic processes associated with the function and activity of the proteins encoded by these nucleic acid molecules. The agents can be the nucleic acid molecules of Table 1

17

themselves, the encoded proteins, or portions of these molecules, such as all or part of the open reading frames of these nucleic acid molecules.

Anti-sense oligonucleotide molecules derived from the nucleic acid sequences of Table 1 may also be used to down-regulate the expression of one or more of the genes in

5   Table 1 that are expressed at elevated levels in liver cancer, the use of antisense gene therapy being an example. Down-regulation of expression of one or more of the genes of Table 1 is accomplished by administering an effective amount of antisense oligonucleotides. These antisense molecules can be fashioned from the DNA sequences of these genes or sequences containing various mutations, deletions, insertions or spliced

10   variants. Isolated RNA or DNA sequences derived from these genes may also be used therapeutically in gene therapy. These agents may be used to induce gene expression in liver cancers associated with an absence of or considerably decreased expression of one or more of the proteins encoded by genes in Table 1.

As used herein, a subject can be any mammal, so long as the mammal is in need of

15   modulation of a pathological or biological process mediated by a gene of the invention. The term "mammal" is defined as an individual belonging to the class Mammalia. The invention is particularly useful in the treatment of human subjects.

Pathological processes refer to a category of biological processes which produce a deleterious effect. For example, expression of a gene of the invention may be associated

20   with hyperplasia in the liver, in particular malignant hyperplasia. As used herein, an agent is said to modulate a pathological process when the agent reduces the degree or severity of the process. For instance, liver cancer may be prevented or disease progression modulated by the administration of agents which up- or down-regulate or modulate in some way the expression or at least one activity of a gene of the invention.

25   The agents of the present invention can be provided alone, or in combination with other agents that modulate a particular pathological process. For example, an agent of the present invention can be administered in combination with other known drugs. As used herein, two agents are said to be administered in combination when the two agents are administered simultaneously or are administered independently in a fashion such that the

30   agents will act at the same time.

The agents of the present invention can be administered via parenteral, subcutaneous, intravenous, intramuscular, intraperitoneal, transdermal, or buccal routes. Alternatively, or concurrently, administration may be by the oral route. The dosage

18

administered will be dependent upon the age, health, and weight of the recipient, kind of concurrent treatment, if any, frequency of treatment, and the nature of the effect desired.

The present invention further provides compositions containing one or more agents which modulate expression or at least one activity of a protein of the invention. While

5   individual needs vary, determination of optimal ranges of effective amounts of each component is within the skill of the art. Typical dosages comprise 0.1 to 100 µg/kg body wt. The preferred dosages comprise 0.1 to 10 µg/kg body wt. The most preferred dosages comprise 0.1 to 1 µg/kg body wt.

In addition to the pharmacologically active agent, the compositions of the present

10   invention may contain suitable pharmaceutically acceptable carriers comprising excipients and auxiliaries which facilitate processing of the active compounds into preparations which can be used pharmaceutically for delivery to the site of action. Suitable formulations for parenteral administration include aqueous solutions of the active compounds in water-soluble form, for example, water-soluble salts. In addition,

15   suspensions of the active compounds as appropriate oily injection suspensions may be administered. Suitable lipophilic solvents or vehicles include fatty oils, *e.g.*, sesame oil, or synthetic fatty acid esters, *e.g.*, ethyl oleate or triglycerides. Aqueous injection suspensions may contain substances which increase the viscosity of the suspension include, for example, sodium carboxymethyl cellulose, sorbitol, and/or dextran.

20   Optionally, the suspension may also contain stabilizers. Liposomes can also be used to encapsulate the agent for delivery into the cell.

The pharmaceutical formulation for systemic administration according to the invention may be formulated for enteral, parenteral or topical administration. Indeed, all three types of formulations may be used simultaneously to achieve systemic

25   administration of the active ingredient.

Suitable formulations for oral administration include hard or soft gelatin capsules, pills, tablets, including coated tablets, elixirs, suspensions, syrups or inhalations and controlled release forms thereof.

In practicing the methods of this invention, the compounds of this invention may

30   be used alone or in combination, or in combination with other therapeutic or diagnostic agents. In certain preferred embodiments, the compounds of this invention may be coadministered along with other compounds typically prescribed for these conditions

19

according to generally accepted medical practice. The compounds of this invention can be utilized in vivo, ordinarily in mammals, such as humans, rats, mice, dogs, cats, sheep, horses, cattle and pigs, or in vitro.

Assay Formats

5   The genes identified as being differentially expressed in liver disease may be used in a variety of nucleic acid detection assays to detect or quantify the expression level of a gene or multiple genes in a given sample. For example, traditional Northern blotting, nuclease protection, RT-PCR and differential display methods may be used for detecting gene expression levels. In methods where small numbers of genes are assayed, such as 5-
10   50 genes, high-throughput PCR may be used.

The protein products of the genes identified herein can also be assayed to determine the amount of expression. Methods for assaying for a protein include Western blot, immunoprecipitation and radioimmunoassay. In some methods, it is preferable to assay the mRNA as an indication of expression. Methods for assaying for mRNA include
15   Northern blots, slot blots, dot blots, and hybridization to an ordered array of oligonucleotides. Any method for specifically and quantitatively measuring a specific protein or mRNA or DNA product can be used. However, methods and assays of the invention are most efficiently designed with array or chip hybridization-based methods for detecting the expression of a large number of genes.

20   Any hybridization assay format may be used, including solution-based and solid support-based assay formats. A preferred solid support is a high density array also known as a DNA chip or a gene chip. One variation of the DNA chip contains hundreds of thousands of discrete microscopic channels that pass completely through it. Probe molecules are attached to the inner surface of these channels, and molecules from the
25   samples to be tested flow throughout the channels, coming into close proximity with the probes for hybridization. In one assay format, gene chips containing probes to at least two genes from Table 1 may be used to directly monitor or detect changes in gene expression in the treated or exposed cell as described herein.

The genes of the present invention may be assayed in any convenient sample
30   form. For example, samples may be assayed in the form mRNA or reverse transcribed mRNA. Samples may be cloned or not, and the samples or individual genes may be amplified or not. The cloning itself does not appear to bias the representation of genes

within a population. However, it may be preferable to use polyA+ RNA as a source, as it can be used with less processing steps. In some embodiments, it may be preferable to assay the protein or peptide expressed by the gene.

The sequences of the expression marker genes of Table 1 are available in the public databases. Table 1 provides the Accession number, Sequence Number ID and name for each of the sequences. The sequences of the genes in GenBank are herein expressly incorporated by reference in their entirety (see www.ncbi.nim.nih.gov).

Additional assay formats may be used to monitor the ability of the agent to modulate the expression of a gene identified in Table 1. For instance, as described above, mRNA expression may be monitored directly by hybridization of probes to the nucleic acids of the invention. Cell lines are exposed to an agent to be tested under appropriate conditions and time and total RNA or mRNA is isolated by standard procedures such those disclosed in Sambrook *et al.*, Molecular Cloning - A Laboratory Manual, Third ed., Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 2001. In some embodiments, it may be desirable to amplify one or more of the RNA molecules isolated prior to application of the RNA to the gene chip. Using techniques well known in the art, the RNA may be reverse transcribed and amplified in the form of DNA or may be reverse transcribed into DNA and the DNA used as a template for transcription to generate recombinant RNA. Any method that results in the production of a sufficient quantity of nucleic acid to be hybridized effectively to the gene chip may be used.

In another format, cell lines that contain reporter gene fusions between the open reading frame and/or the 3' or 5' regulatory regions of a gene in Table 1 and any assayable fusion partner may be prepared. Numerous assayable fusion partners are known and readily available including the firefly luciferase gene and the gene encoding chloramphenicol acetyltransferase (Alam *et al.*, *Anal Biochem* 188:245-254, 1990). Cell lines containing the reporter gene fusions are then exposed to the agent to be tested under appropriate conditions and time. Differential expression of the reporter gene between samples exposed to the agent and control samples identifies agents which modulate the expression of the nucleic acid.

In another assay format, cells or cell lines are first identified which express one or more of the gene products of the invention physiologically. Cells and/or cell lines so identified would preferably comprise the necessary cellular machinery to ensure that the transcriptional and/or translational apparatus of the cells would faithfully mimic the

21

response of normal or cancerous liver tissue to an exogenous agent. Such machinery would likely include appropriate surface transduction mechanisms and/or cytosolic factors. Such cell lines may be, but are not required to be, derived from liver tissue. The cells and/or cell lines may then be contacted with an agent and the expression of one or

5   more of the genes of interest may then be assayed. The genes may be assayed at the mRNA level and/or at the protein level.

In some embodiments, such cells or cell lines may be transduced or transfected with an expression vehicle (e.g., a plasmid or viral vector) containing an expression construct comprising an operable 5'-promoter containing end of a gene of interest

10   identified in Table 1 fused to one or more nucleic acid sequences encoding one or more antigenic fragments. The construct may comprise all or a portion of the coding sequence of the gene of interest which may be positioned 5'- or 3'- to a sequence encoding an antigenic fragment. The coding sequence of the gene of interest may be translated or un-translated after transcription of the gene fusion. At least one antigenic fragment may be

15   translated. The antigenic fragments are selected so that the fragments are under the transcriptional control of the promoter of the gene of interest and are expressed in a fashion substantially similar to the expression pattern of the gene of interest. The antigenic fragments may be expressed as polypeptides whose molecular weight can be distinguished from the naturally occurring polypeptides.

20   In some embodiments, gene products of the invention may further comprise an immunologically distinct tag. Such a process is well known in the art (see Sambrook *et al.*, *supra*). Cells or cell lines transduced or transfected as outlined above are then contacted with agents under appropriate conditions; for example, the agent comprises a pharmaceutically acceptable excipient and is contacted with cells comprised in an aqueous

25   physiological buffer such as phosphate buffered saline (PBS) at physiological pH, Eagles balanced salt solution (BSS) at physiological pH, PBS or BSS comprising serum or conditioned media comprising PBS or BSS and serum incubated at 37°C. Said conditions may be modulated as deemed necessary by one of skill in the art. Subsequent to contacting the cells with the agent, said cells will be disrupted and the polypeptides of the

30   lysate are fractionated such that a polypeptide fraction is pooled and contacted with an antibody to be further processed by immunological assay (e.g., ELISA, immunoprecipitation or Western blot). The pool of proteins isolated from the "agent-

22

contacted" sample will be compared with a control sample where only the excipient is contacted with the cells and an increase or decrease in the immunologically generated signal from the "agent-contacted" sample compared to the control will be used to distinguish the effectiveness of the agent.

Another embodiment of the present invention provides methods for identifying agents that modulate the levels, concentration or at least one activity of a protein(s) encoded by the genes in Table 1. Such methods or assays may utilize any means of monitoring or detecting the desired activity.

In one format, the relative amounts of a protein of the invention produced in a cell population that has been exposed to the agent to be tested may be compared to the amount produced in an un-exposed control cell population. In this format, probes such as specific antibodies are used to monitor the differential expression of the protein in the different cell populations. Cell lines or populations are exposed to the agent to be tested under appropriate conditions and time. Cellular lysates may be prepared from the exposed cell line or population and a control, unexposed cell line or population. The cellular lysates are then analyzed with the probe, such as a specific antibody.

Probe design

Probes based on the sequences of the genes described herein may be prepared by any commonly available method. Oligonucleotide probes for assaying the tissue or cell sample are preferably of sufficient length to specifically hybridize only to appropriate, complementary genes or transcripts. Typically the oligonucleotide probes will be at least 10, 12, 14, 16, 18, 20 or 25 nucleotides in length. In some cases longer probes of at least 30, 40, or 50 nucleotides will be desirable.

One of skill in the art will appreciate that an enormous number of array designs are suitable for the practice of this invention. The high density array will typically include a number of probes that specifically hybridize to the sequences of interest. See WO 99/32660 for methods of producing probes for a given gene or genes. In addition, in a preferred embodiment, the array will include one or more control probes.

High density array chips of the invention include "test probes." Test probes may be oligonucleotides that range from about 5 to about 500 or about 5 to about 50 nucleotides, more preferably from about 10 to about 40 nucleotides and most preferably from about 15 to about 40 nucleotides in length. In other particularly preferred

embodiments, the probes are about 20 or 25 nucleotides in length. In another preferred

embodiment, test probes are double or single strand DNA sequences. DNA sequences

may be isolated or cloned from natural sources or amplified from natural sources using

natural nucleic acid as templates. These probes have sequences complementary to

particular subsequences of the genes whose expression they are designed to detect. Thus,

the test probes are capable of specifically hybridizing to the target nucleic acid they are to

detect.

In addition to test probes that bind the target nucleic acid(s) of interest, the high

density array can contain a number of control probes. The control probes fall into three

categories referred to herein as (1) normalization controls; (2) expression level controls;

and (3) mismatch controls.

Normalization controls are oligonucleotide or other nucleic acid probes that are

complementary to labeled reference oligonucleotides or other nucleic acid sequences that

are added to the nucleic acid sample. The signals obtained from the normalization

controls after hybridization provide a control for variations in hybridization conditions,

label intensity, "reading" efficiency and other factors that may cause the signal of a perfect

hybridization to vary between arrays. In a preferred embodiment, signals (e.g.,

fluorescence intensity) read from all other probes in the array are divided by the signal

(e.g., fluorescence intensity) from the control probes thereby normalizing the

measurements.

Virtually any probe may serve as a normalization control. However, it is

recognized that hybridization efficiency varies with base composition and probe length.

Preferred normalization probes are selected to reflect the average length of the other

probes present in the array, however, they can be selected to cover a range of lengths. The

normalization control(s) can also be selected to reflect the (average) base composition of

the other probes in the array, however in a preferred embodiment, only one or a few

probes are used and they are selected such that they hybridize well (i.e., no secondary

structure) and do not match any target-specific probes.

Expression level controls are probes that hybridize specifically with

constitutively expressed genes in the biological sample. Virtually any constitutively

expressed gene provides a suitable target for expression level controls. Typical expression

level control probes have sequences complementary to subsequences of constitutively

24

expressed "housekeeping genes" including, but not limited to the β-actin gene, the transferrin receptor gene, the GAPDH gene, and the like.

Mismatch controls may also be provided for the probes to the target genes, for expression level controls or for normalization controls. Mismatch controls are oligonucleotide probes or other nucleic acid probes identical to their corresponding test or control probes except for the presence of one or more mismatched bases. A mismatched base is a base selected so that it is not complementary to the corresponding base in the target sequence to which the probe would otherwise specifically hybridize. One or more mismatches are selected such that under appropriate hybridization conditions (*e.g.*, stringent conditions) the test or control probe would be expected to hybridize with its target sequence, but the mismatch probe would not hybridize (or would hybridize to a significantly lesser extent). Preferred mismatch probes contain a central mismatch. Thus, for example, where a probe is a twenty-mer, a corresponding mismatch probe may have the identical sequence except for a single base mismatch (e.g., substituting a G, a C or a T for an A) at any of positions 6 through 14 (the central mismatch).

Mismatch probes thus provide a control for non-specific binding or cross hybridization to a nucleic acid in the sample other than the target to which the probe is directed. Mismatch probes also indicate whether a hybridization is specific or not. For example, if the target is present the perfect match probes should be consistently brighter than the mismatch probes. In addition, if all central mismatches are present, the mismatch probes can be used to detect a mutation. The difference in intensity between the perfect match and the mismatch probe (I(PM) - I(MM)) provides a good measure of the concentration of the hybridized material.

Nucleic Acid Samples

As is apparent to one of ordinary skill in the art, nucleic acid samples used in the methods and assays of the invention may be prepared by any available method or process. Methods of isolating total mRNA are also well known to those of skill in the art. For example, methods of isolation and purification of nucleic acids are described in detail in Chapter 3 of Laboratory Techniques in Biochemistry and Molecular Biology, Vol. 24, Hybridization With Nucleic Acid Probes: Theory and Nucleic Acid Probes, P. Tijssen (ed.) Elsevier Press, New York, 1993. Such samples include RNA samples, but also include cDNA synthesized from a mRNA sample isolated from a cell or tissue of interest.

25

Such samples also include DNA amplified from the cDNA, and an RNA transcribed from the amplified DNA. One of skill in the art would appreciate that it may be desirable to inhibit or destroy RNase present in homogenates before homogenates can be used.

Biological samples may be of any biological tissue or fluid or cells from any organism as well as cells raised *in vitro*, such as cell lines and tissue culture cells. Frequently the sample will be a "clinical sample" which is a sample derived from a patient. Typical clinical samples include, but are not limited to, liver tissue biopsy, sputum, blood, blood-cells (e.g., white cells), tissue or fine needle biopsy samples, urine, peritoneal fluid, and pleural fluid, or cells therefrom. Biological samples may also include sections of tissues, such as frozen sections or formalin fixed sections taken for histological purposes.

Solid Supports

Solid supports containing oligonucleotide probes for differentially expressed genes can be any solid or semisolid support material known to those skilled in the art. Suitable examples include, but are not limited to, membranes, filters, tissue culture dishes, polyvinyl chloride dishes, beads, test strips, silicon or glass based chips and the like. Suitable glass wafers and hybridization methods are widely available, for example, those disclosed by Beattie (WO 95/11755). Any solid surface to which oligonucleotides can be bound, either directly or indirectly, either covalently or non-covalently, can be used. In some embodiments, it may be desirable to attach some oligonucleotides covalently and others non-covalently to the same solid support.

A preferred solid support is a high density array or DNA chip. These contain a particular oligonucleotide probe in a predetermined location on the array. Each predetermined location may contain more than one molecule of the probe, but each molecule within the predetermined location has an identical sequence. Such predetermined locations are termed features. There may be, for example, from 2, 10, 100, 1000 to 10,000, 100,000 or 400,000 of such features on a single solid support. The solid support, or the area within which the probes are attached may be on the order of a square centimeter.

Oligonucleotide probe arrays for expression monitoring can be made and used according to any techniques known in the art (see for example, Lockhart *et al.*, *Nat Biotechnol* 14:1675-1680, 1996; McGall *et al.*, *Proc Nat Acad Sci USA* 93: 13555-13460, 1996). Such probe arrays may contain at least two or more oligonucleotides that are

26

complementary to or hybridize to two or more of the genes described herein. Such arrays my also contain oligonucleotides that are complementary or hybridize to at least 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, 50, 70 or more the genes described herein.

Methods of forming high density arrays of oligonucleotides with a minimal number of synthetic steps are known. The oligonucleotide analogue array can be synthesized on a solid substrate by a variety of methods, including, but not limited to, light-directed chemical coupling, and mechanically directed coupling (see Pirrung et al., (1992) U.S. Patent No. 5,143, 854; Fodor et al., (1998) U.S. Patent No. 5,800,992; Chee et al., (1998) 5,837,832).

In brief, the light-directed combinatorial synthesis of oligonucleotide arrays on a glass surface proceeds using automated phosphoramidite chemistry and chip masking techniques. In one specific implementation, a glass surface is derivatized with a silane reagent containing a functional group, e.g., a hydroxyl or amine group blocked by a photolabile protecting group. Photolysis through a photolithogaphic mask is used selectively to expose functional groups which are then ready to react with incoming 5' photoprotected nucleoside phosphoramidites. The phosphoramidites react only with those sites which are illuminated (and thus exposed by removal of the photolabile blocking group). Thus, the phosphoramidites only add to those areas selectively exposed from the preceding step. These steps are repeated until the desired array of sequences have been synthesized on the solid surface. Combinatorial synthesis of different oligonucleotide analogues at different locations on the array is determined by the pattern of illumination during synthesis and the order of addition of coupling reagents.

In addition to the foregoing, additional methods which can be used to generate an array of oligonucleotides on a single substrate are described in Fodor et al. WO 93/09668. High density nucleic acid arrays can also be fabricated by depositing pre-made or natural nucleic acids in predetermined positions. Synthesized or natural nucleic acids are deposited on specific locations of a substrate by light directed targeting and oligonucleotide directed targeting. Another embodiment uses a dispenser that moves from region to region to deposit nucleic acids in specific spots.

Hybridization

Nucleic acid hybridization simply involves contacting a probe and target nucleic acid under conditions where the probe and its complementary target can form stable

27

hybrid duplexes through complementary base pairing (see Lockhart *et al.*, (1999) WO 99/32660). The nucleic acids that do not form hybrid duplexes are then washed away leaving the hybridized nucleic acids to be detected, typically through detection of an attached detectable label. It is generally recognized that nucleic acids are denatured by

5   increasing the temperature or decreasing the salt concentration of the buffer containing the nucleic acids. Under low stringency conditions (*e.g.*, low temperature and/or high salt) hybrid duplexes (*e.g.*, DNA-DNA, RNA-RNA or RNA-DNA) will form even where the annealed sequences are not perfectly complementary. Thus, specificity of hybridization is reduced at lower stringency. Conversely, at higher stringency (*e.g.*, higher temperature or

10   lower salt) successful hybridization requires fewer mismatches. One of skill in the art will appreciate that hybridization conditions may be selected to provide any degree of stringency. In a preferred embodiment, hybridization is performed at low stringency, in this case in 6× SSPE-T at 37°C (0.005% Triton x-100) to ensure hybridization and then subsequent washes are performed at higher stringency (*e.g.*, 1× SSPE-T at 37°C) to

15   eliminate mismatched hybrid duplexes. Successive washes may be performed at increasingly higher stringency (*e.g.*, down to as low as 0.25× SSPET at 37°C to 50°C) until a desired level of hybridization specificity is obtained. Stringency can also be increased by addition of agents such as formamide. Hybridization specificity may be evaluated by comparison of hybridization to the test probes with hybridization to the

20   various controls that can be present (*e.g.*, expression level control, normalization control, mismatch controls, *etc.*).

       In general, there is a tradeoff between hybridization specificity (stringency) and signal intensity. Thus, in a preferred embodiment, the wash is performed at the highest stringency that produces consistent results and that provides a signal intensity greater than

25   approximately 10% of the background intensity. Thus, in a preferred embodiment, the hybridized array may be washed at successively higher stringency solutions and read between each wash. Analysis of the data sets thus produced will reveal a wash stringency above which the hybridization pattern is not appreciably altered and which provides adequate signal for the particular oligonucleotide probes of interest.

30   *Signal Detection*

       The hybridized nucleic acids are typically detected by detecting one or more labels attached to the sample nucleic acids. The labels may be incorporated by any of a

28

number of means well known to those of skill in the art (see Lockhart *et al.*, (1999) WO 99/32660).

Databases

The present invention includes relational databases containing sequence

5   information, for instance for one or more of the genes of Table 1, as well as gene expression information in various liver tissue samples. Databases may also contain information associated with a given sequence or tissue sample such as descriptive information about the gene associated with the sequence information, descriptive information concerning the clinical status of the tissue sample, or information concerning

10   the patient from which the sample was derived. The database may be designed to include different parts, for instance a sequence database and a gene expression database. The databases of the invention may be stored on any available computer-readable medium. Methods for the configuration and construction of such databases are widely available, for instance, see Akerblom *et al.*, (U.S. Patent 5,953,727), which is specifically incorporated

15   herein by reference in its entirety.

The databases of the invention may be linked to an outside or external database. In a preferred embodiment, as described in Table 1, the external database is GenBank and the associated databases maintained by the National Center for Biotechnology Information or NCBI (http://www.ncbi.nlm.nih.gov/Entrez/). Other external databases that may be

20   used in the invention include those provided by Chemical Abstracts Service (http://stnweb.cas.org/) and Incyte Genomics (http://www.incyte.com/sequence/index.shtml).

Any appropriate computer platform may be used to perform the necessary comparisons between sequence information, gene expression information and any other

25   information in the database or provided as an input. For example, a large number of computer workstations are available from a variety of manufacturers, such has those available from Silicon Graphics. Client-server environments, database servers and networks are also widely available and appropriate platforms for the databases of the invention.

30   The databases of the invention may be used to produce, among other things, electronic Northern blots (E-Northerns) to allow the user to determine the cell type or tissue in which a given gene is expressed and to allow determination of the abundance or

29

expression level of a given gene in a particular tissue or cell. The E-northern analysis can be used as a tool to discover tissue specific candidate therapeutic targets that are not over-expressed in tissues such as the liver, kidney, or heart. These tissue types often lead to detrimental side effects once drugs are developed and a first-pass screen to eliminate these
5   targets early in the target discovery and validation process would be beneficial.

The databases of the invention may also be used to present information identifying the expression level in a tissue or cell of a set of genes comprising at least one gene in Table 1, comprising the step of comparing the expression level of at least one gene in Table 1 in the tissue to the level of expression of the gene in the database. Such
10   methods may be used to predict the physiological state of a given tissue by comparing the level of expression of a gene or genes in Table 1 from a sample to the expression levels found in normal liver tissue, tissue from liver carcinomas or both. Such methods may also be used in the drug or agent screening assays as described herein.

Without further description, it is believed that one of ordinary skill in the art can,
15   using the preceding description and the following illustrative examples, make and utilize the compounds of the present invention and practice the claimed methods. The preceding working examples therefore, are illustrative only and should not be construed as limiting in any way the scope of the invention.

Examples
20   *Example 1: Preparation of Liver Disease Profiles*

Tissue Sample Acquisition and Preparation

The patient tissue samples were derived from ten Korean patients, aged 34 to 65, and classified into two groups of five patients each. Each group contained samples from four men and one woman. One group of consisted of patients who had been diagnosed
25   with chronic viral hepatitis B and who later developed hepatic carcinomas. The second group of patients had been diagnosed with cirrhosis of the liver. These people also later developed hepatic carcinomas. For each patient, tissue was obtained from two areas of the liver to produce a set of biopsy samples. In the first patient group (cancer/hepatitis), samples were removed from liver tumors and from the non-cancerous surrounding area
30   composed of inflamed tissue (inflammation due to hepatitis). In the second group

30

(cancer/cirrhosis), liver tissue was removed from tumors and from the non-cancerous surrounding area composed of fibrotic tissue (areas of fibrosis due to cirrhosis).

Histological analysis of each of the tissue samples was performed and samples were segregated into either non-cancerous or cancerous categories.

With minor modifications, the sample preparation protocol followed the Affymetrix GeneChip Expression Analysis Manual. Frozen tissue was first ground to powder using the Spex Certiprep 6800 Freezer Mill. Total RNA was then extracted using Trizol (Life Technologies). The total RNA yield for each sample (average tissue weight of 300 mg) was 200-500 μg. Next, mRNA was isolated using the Oligotex mRNA Midi kit (Qiagen). Since the mRNA was eluted in a final volume of 400 μl, an ethanol precipitation step was required to bring the concentration to 1 μg/μl. Using 1-5 μg of mRNA, double stranded cDNA was created using the SuperScript Choice system (Gibco-BRL). First strand cDNA synthesis was primed with a T7-(dT$_{24}$) oligonucleotide. The cDNA was then phenol-chloroform extracted and ethanol precipitated to a final concentration of 1 μg/μl.

From 2 μg of cDNA, cRNA was synthesized according to standard procedures. To biotin label the cRNA, nucleotides Bio-11-CTP and Bio-16-UTP (Enzo Diagnostics) were added to the reaction. After a 37°C incubation for six hours, the labeled cRNA was cleaned up according to the Rneasy Mini kit protocol (Qiagen). The cRNA was then fragmented (5× fragmentation buffer: 200 mM Tris-Acetate (pH 8.1), 500 mM KOAc, 150 mM MgOAc) for thirty-five minutes at 94°C.

55 μg of fragmented cRNA was hybridized on the human and the Human Genome U95 set of arrays for twenty-four hours at 60 rpm in a 45°C hybridization oven. The chips were washed and stained with Streptavidin Phycoerythrin (SAPE) (Molecular Probes) in Affymetrix fluidics stations. To amplify staining, SAPE solution was added twice with an anti-streptavidin biotinylated antibody (Vector Laboratories) staining step in between. Hybridization to the probe arrays was detected by fluorometric scanning (Hewlett Packard Gene Array Scanner). Following hybridization and scanning, the microarray images were analyzed for quality control, looking for major chip defects or abnormalities in hybridization signal. After all chips passed QC, the data was analyzed using Affymetrix GeneChip software (v3.0), and Experimental Data Mining Tool (EDMT) software (v1.0).

Gene Expression Analysis

All samples were prepared as described and hybridized onto the Affymetrix Human Genome U95 array. Each chip contains 16-20 oligonucleotide probe pairs per gene or cDNA clone. These probe pairs include perfectly matched sets and mismatched sets, both of which are necessary for the calculation of the average difference. The average difference is a measure of the intensity difference for each probe pair, calculated by subtracting the intensity of the mismatch from the intensity of the perfect match. This takes into consideration variability in hybridization among probe pairs and other hybridization artifacts that could affect the fluorescence intensities. Using the average difference value that has been calculated, an absolute call for each gene is made.

The absolute call of present, absent or marginal is used to generate a Gene Signature, a tool used to identify those genes that are commonly present or commonly absent in a given sample set, according to the absolute call.

The Gene Signature Curve is a graphic view of the number of genes consistently present in a given set of samples as the sample size increases, taking into account the genes commonly expressed among a particular set of samples, and discounting those genes whose expression is variable among those samples. The curve is also indicative of the number of samples necessary to generate an accurate Gene Signature. As the sample number increases, the number of genes common to the sample set decreases. The curve is generated using the positive Gene Signatures of the samples in question, determined by adding one sample at a time to the Gene Signature, beginning with the sample with the smallest number of present genes and adding samples in ascending order. The curve displays the sample size required for the most consistency and the least amount of expression variability from sample to sample. The point where this curve begins to level off represents the minimum number of samples required for the Gene Signature. Graphed on the x-axis is the number of samples in the set, and on the y-axis is the number of genes in the positive Gene Signature. As a general rule, the acceptable percent of variability in the number of positive genes between two sample sets should be less than 5%.

For the purposes of this study, the following statistical methods were used for the data analysis. A gene set consists of genes that have a certain percentage of present calls in at least one group of samples. These genes are analyzed, and others are excluded. For example, a gene having 40% present calls (2 out of 5 samples) in at least in one sample group, cancerous cells from either hepatitis or cirrhosis patients, or non-cancerous cells

32

from either type of patient, is included in the analysis if 40% is above the lower limit for percent present calls. Also, the genes are divided into two groups depending on their expression values across samples. For the genes in the high expression group, the average difference value is transformed to log scale before the analysis. For the genes in the low expression group, the original values are used in the analysis. An Analysis of Variance (ANOVA) method is used for data analysis (Steel et al., Principles and Procedures of Statistics: A Biometrical Approach, Third Ed., McGraw-Hill, 1997). Prior to the final analysis, a leave-one-out approach is used for outlier detection. One sample is left out of the ANOVA analysis to see whether omitting a specific sample from the analysis has any significant effect on the final result. If so, that particular sample is excluded from the final analysis. After outlier detection, the final analysis produces a list of genes that are differentially expressed with a p-value ≤ 0.001 as determined by the contrast from the ANOVA.

Differentially expressed genes were discovered by comparing biopsy samples from cancerous and non-cancerous regions of the same liver in patients with chronic viral hepatitis (CH) or liver cirrhosis (LC) who went on to develop primary liver cancer (hepatocellular carcinoma or HCC). Genes which showed no difference in expression level between a the cancerous and non-cancerous samples were not included in Table 1. Group 1 of Table 1 (23 genes) lists the genes that were found to be differentially expressed when the level in liver tumor cells was compared to the level in non-cancerous cells from inflamed areas or from fibrotic areas. Group 2 (12 genes) lists the genes whose expression level differed in liver tumor cells compared to cells from areas of inflammation, and group 3 contains those genes whose expression level differed in liver tumor cells compared to cells from fibrotic regions of the liver (74 genes).

Fold Change analysis

The data was first filtered to exclude all genes that showed no expression in any of the samples. The ratio (cancerous/non-cancerous, HCC/CH or HCC/LC) was calculated by comparing the mean expression value for each gene in the cancerous sample set against the mean expression value of that gene in the non-cancerous sample set. Genes were included in the analysis if they had a fold change ≥ 1.5 in either direction, and a p-value < 0.0007 as determined by an Analysis of Variance Test (ANOVA). According to the criteria of the test, differences having p-values below 0.0007 were determined to be

statistically significant. Out of the ~60,000 genes surveyed by the Human Genome U95 set, 109 genes were present in the overall fold change analysis. In Table 1, numbers representing a comparison, or fold change, between the level of expression of a gene in two disease state liver biopsy samples can be positive or negative. Positive values indicate

5   a higher expression level in the cancerous sample compared to the non-cancerous sample (up-regulation), while negative values indicate a lower expression level in the cancerous sample compared to the non-cancerous sample (down-regulation).

Expression Profies of Genes Differentially Expressed in Liver Disease

10   Using the above described methods, genes that were predominantly over-expressed in liver cancer, or predominantly under-expressed in liver cancer, were identified. Genes with consistent differential expression patterns provide potential targets for broad range diagnostics and therapeutics.

           Table 1 lists the genes determined to be differentially expressed in cancerous liver

15   tissue compared to non-cancerous liver tissue, with the fold change value for each gene. More specifically, the level of expression of the genes of Table 1 in liver cancer cells was compared to the level of expression in tissue from inflamed and/or fibrotic areas of the liver. The set of genes in each group, along with their relative expression levels, creates a profile for the diseases examined, chronic hepatitis with hepatic carcinoma and cirrhosis

20   with hepatic carcinoma.

           These genes or subsets of these genes confirm an overall liver disease gene expression profile. The genes in Table 1 may be used alone, or in combination with the methods, compositions, databases and computer systems of the invention.

Example 2: Diagnostic Subset of Liver Disease Associated GeneCluster Analysis

25   Table 1 lists the members of diagnostic subsets of genes selected by p-value in groups 2 and 3 (12 and 74 genes, respectively). In addition to their diagnostic, monitoring, drug screening and therapeutic uses, these groups of genes can be used to differentiate between liver tumor samples from subjects with chronic hepatitis and liver tumor samples from subjects with cirrhosis. Assays measuring the expression level of these genes are

30   capable of distinguishing between carcinomas arising in chronic hepatitis patients versus carcinomas arising in cirrhosis patients.

34

The gene subsets of Table 1 can, therefore, be used to identify the presence of a malignant tumor in liver tissue from chronic hepatitis or cirrhosis patients, to monitor the progression of the tumor (*e.g.*, during cancer treatment or combined disease treatments), to evaluate the effects of therapeutic agents for treating the tumor or to distinguish the origin

5   or predisposing condition of the tumor.

Although the present invention has been described in detail with reference to examples above, it is understood that various modifications can be made without departing from the spirit of the invention. Accordingly, the invention is limited only by the following claims. All cited patents and publications referred to in this application are

10   herein incorporated by reference in their entirety.

Table 1- Genes Differentially Expressed in Liver Cancer

Fragment Name	Seq. ID	Accession Number	UniGene ID	Description	HCC/CH	HCC/LC	p-Values for HCC/CH	p-Values for HCC/LC
Group 1 : HCC/CH and HCC/LC								
33428_s_at	1	AF034957	Hs.194019	attractin	4.10	2.84	0.0002690	0.0002720
36785_at	2	Z23090	Hs.76067	heat shock 27kD protein 1	2.71	3.49	0.0001100	0.0000150
74893_g_at	3	AA928646	Hs.75864	endoplasmic reticulum glycoprotein	2.47	2.25	0.000748	0.000034
51788_at	4	AW023096	Hs.3887	proteasome (prosome, macropain) 26S subunit, non-ATPase, 1	2.03	1.74	0.000464	0.000647
44143_at	5	AA399076	Hs.46743	McKusick-Kaufman syndrome	1.65	1.52	0.000645	0.00038
832_at	6	U39317	Hs.108332	ubiquitin-conjugating enzyme E2D 2 (homologous to yeast UBC4/5)	1.50	1.69	0.000222	0.000274
57042_at	7	W74749	Hs.285818	similar to Caenorhabditis elegans protein C42C1.9	-1.80	-2.71	0.000394	0.000056
55107_at	8	AI916306	Hs.87125	EH-domain containing 3	-1.91	-3.32	0.000099	0
33766_at	9	X77777	Hs.198726	vasoactive intestinal peptide receptor 1	-1.96	-2.43	0.000039	0.00001
37206_at	10	X63359	Hs.294039	UDP glycosyltransferase 2 family, polypeptide B10	-2.03	-4.69	0.000016	4.00E-06
37059_at	11	Z48475	Hs.89771	glucokinase (hexokinase 4) regulatory protein	-2.41	-10.31	0.000679	0.000872
533_g_at	12	U17418	Hs.1019	parathyroid hormone receptor 1	-2.77	-3.31	0.000064	0.00003
35803_at	13	S82240	Hs.6838	ras homolog gene family, member E	-3.62	-8.20	1.00E-06	0
33862_at	14	AF017786	Hs.173717	phosphatidic acid phosphatase type 2B	-4.27	-3.55	0.000161	0.000757
44982_s_at	15	AI985046	Hs.24395	small inducible cytokine subfamily B (Cys-X-Cys), member 14 (BRAK)	-5.65	-12.23	0	0
32666_at	16	U19495	Hs.237356	stromal cell-derived factor 1	-6.47	-6.54	0.000041	0.000012
35118_at	17	M12625	Hs.325507	lecithin-cholesterol acyltransferase	-6.48	-23.56	0.000032	0.000165
55063_at	18	AL042399	Hs.75668	glutamate decarboxylase 1 (brain, 67kD)	-7.52	-23.54	0.000099	7.00E-06
34602_at	19	D63160	Hs.54517	ficolin (collagen/fibrinogen domain-containing) 2 (hucolin)	-7.54	-10.65	0.000032	0.00002
34708_at	20	D88587	Hs.333383	ficolin (collagen/fibrinogen domain-containing)-3 (Hakata antigen)	-9.43	-21.71	0.000271	0.000059
39120_at	21	AA224832	Hs.94360	metallothionein 1L	-9.97	-35.38	0.000089	3.00E-06
45943_at	22	AI052592	Hs.35718	cytochrome P450, subfamily VIIIB (sterol 12-alpha-hydroxylase), polypeptide 1	-11.93	-26.66	0.000178	0.000914
56641_at	23	AI937227	Hs.8821	liver-expressed antimicrobial peptide	-19.90	-66.71	0.000708	0.00097
Group 2 : HCC/CH								
45313_at	24	AA167715	Hs.296244	fatty acid synthase	4.22	2.44	0.000396	.
85972_at	25	AI424433	Hs.306000	solute carrier family 4 (anion exchanger), member 1, adapter protein	1.92	2.24	0.000318	.
1840_g_at		HG1112-HT11	Hs.10842	RAN, member RAS oncogene family	1.96	1.88	0.000705	.
33667_at	26	X52851	Hs.182937	peptidylprolyl isomerase A (cyclophilin A)	1.74	1.35	0.000879	.
53474_at	27	AF072812	Hs.7765	chromosome 16 open reading frame 5	-1.91	-2.04	0.000253	.

Table 1- Genes Differentially Expressed in Liver Cancer

Fragment Name	Seq. ID	Accession Number	UniGene ID	Description	HCC/CH	HCC/LC	p-Values for	
							HCC/CH	HCC/LC
34367_at	28	AF006043	Hs.3343	phosphoglycerate dehydrogenase	-4.06	-2.72	0.000976	
38862_at	29	Y11215	Hs.19126	src kinase-associated phosphoprotein of 55 kDa	-3.73	-3.09	0.000593	
40325_at	30	AB014460	Hs.66196	nth (E.coli endonuclease III)-like 1	-2.52	-3.18	0.000312	
32727_at	31	AF037062	Hs.172914	retinol dehydrogenase 5 (11-cisand 9-cis)	-4.50	-3.42	0.000216	
37319_at	32	M35878	Hs.77326	insulin-like growth factor binding protein 3	-5.33	-3.71	0.000339	
35063_at	33	D50030	Hs.104	HGF activator	-3.99	-8.29	0.000159	
1391_s_at	34	L04751	Hs.1645	cytochrome P450, subfamily IVA, polypeptide 11	-1.76	-14.90	0.000824	
32966_at	35	L27050	Hs.2388	apolipoprotein F	-6.33	-16.30	0.000026	
Group 3 : HCC/LC								
37482_at	36	U37100	Hs.116724	aldo-keto reductase family 1, member B11 (aldose reductase-like)	11.79	27.19		0.000874
33404_at	37	U02390	Hs.296341	adenylyl cyclase-associated protein 2	2.60	7.77		0.0002
63545_at	38	AW006831	Hs.337478	RAB, member of RAS oncogene family-like 2B	3.71	7.20		0.000793
34390_at	39	U90441	Hs.3622	procollagen-proline, 2-oxoglutarate 4-dioxygenase (proline 4-hydroxylase), alpha polypeptide II	3.58	6.27		0.000211
33873_at	40	D43642	Hs.2430	transcription factor-like 1	2.29	5.88		0.000472
893_at	41	M91670	Hs.174070	ubiquitin carrier protein	2.51	5.85		0.000206
59749_at	42	AI478190	Hs.324178	solute carrier family 25 (mitochondrial carrier; adenine nucleotide translocator), member 6	1.21	5.18		0.000638
39749_at	43	U51007	Hs.148495	proteasome (prosome, macropain) 26S subunit, non-ATPase, 4	2.01	4.91		0.000288
44695_at	44	AI953020	Hs.324618	HSPC142 protein	2.71	4.66		0.000153
43836_s_at	45	AI971969	Hs.282997	glucosidase, beta; acid (includes glucosylceramidase)	1.91	4.21		9.00E-06
39801_at	46	AF046889	Hs.153357	procollagen-lysine, 2-oxoglutarate 5-dioxygenase 3	3.32	4.11		0.000257
44219_at	47	AI937030	Hs.287883	X11L-binding protein 51	1.44	3.92		0.00032
37256_at	48	AI829890	Hs.78524	TcD37 homolog	1.79	3.76		0.00064
37399_at	49	D17793	Hs.78183	aldo-keto reductase family 1, member C3 (3-alpha hydroxysteroid dehydrogenase, type II)	2.53	3.76		4.00E-06
35820_at	50	X62078	Hs.289082	GM2 ganglioside activator protein	2.10	3.69		0.00034
1100_at	51	L76191	Hs.182018	interleukin-1 receptor-associated kinase 1	3.76	3.60		0.000816
146_at	52	U81802	Hs.154846	phosphatidylinositol 4-kinase, catalytic, beta polypeptide	1.90	3.42		0.000767
77990_at	53	AW004018	Hs.268281	CGI-201 protein	1.76	3.39		0.000842

Table 1- Genes Differentially Expressed in Liver Cancer

Fragment Name	Seq. ID	Accession Number	UniGene ID	Description	HCC/CH	HCC/LC	p-Values for HCC/CH	p-Values for HCC/LC
32799_at	54	AF023268	Hs.200600	secretory carrier membrane protein 3	1.81	3.25	.	0.00009
32260_at	55	X86809	Hs.194673	phosphoprotein enriched in astrocytes 15	2.14	3.17	.	0.000599
497_at	56	U32680	Hs.194660	ceroid-lipofuscinosis, neuronal 3, juvenile (Batten, Spielmeyer-Vogt disease)	1.97	3.14	.	0.00013
33154_at	57	D26600	Hs.89545	proteasome (prosome, macropain) subunit, beta type, 4	1.62	3.08	.	0.000019
39062_at	58	AL008726	Hs.118126	protective protein for beta-galactosidase (galactosialidosis)	2.18	3.05	.	0.00004
56378_at	59	W22366	Hs.337078	NICE-5 protein	1.45	3.02	.	0.000292
45155_at	60	AI433892	Hs.38738	claudin 15	2.14	2.95	.	0.000669
44082_at	61	AA029831	Hs.238928	HT002 protein; hypertension-related calcium-regulated gene	1.63	2.94	.	0.00064
57136_at	62	AI279571	Hs.23528	HSPC038 protein	1.54	2.93	.	0.000293
64501_at	63	AI982714	Hs.93832	putative membrane protein	1.97	2.70	.	0.000498
34835_at	64	D87442	Hs.4788	nicastrin	1.62	2.69	.	0.000332
41322_s_at	65	AI816034	Hs.23990	nucleolar protein family A, member 2 (H/ACA small nucleolar RNPs)	1.89	2.61	.	0.000756
44821_at	66	AI634570	Hs.301005	purine-rich element binding protein B	1.96	2.58	.	0.000034
48913_at	67	AI023344	Hs.12865	p47	1.51	2.56	.	0.000807
35685_at	68	Z14000	Hs.35384	ring finger protein 1	1.43	2.52	.	0.000061
64886_at	69	AA632300	Hs.65648	RNA binding motif protein 8A	1.58	2.40	.	0.000325
74577_s_at	70	AI798743	Hs.183994	RAD9 (S. pombe) homolog	1.77	2.38	.	0.000159
45712_at	71	H98166	Hs.279868	SUMO-1 activating enzyme subunit 1	1.52	2.30	.	0.000214
90637_at	72	AA039699	Hs.7101	anaphase-promoting complex subunit 5	1.40	2.28	.	0.000854
1659_s_at	73	D78132	Hs.279903	Ras homolog enriched in brain 2	1.98	2.20	.	0.00049
38719_at	74	U03985	Hs.108802	N-ethylmaleimide-sensitive factor	2.03	2.14	.	0.000546
37669_s_at	75	U16799	Hs.78629	ATPase, Na+/K+ transporting, beta 1 polypeptide	1.58	2.12	.	0.000082
45255_at	76	AI354351	Hs.237924	CGI-69 protein	1.99	2.11	.	0.000599
1309_at	77	D26598	Hs.82793	proteasome (prosome, macropain) subunit, beta type, 3	1.91	1.83	.	0.000106
33659_at	78	X95404	Hs.180370	cofilin 1 (non-muscle)	1.64	1.63	.	0.000997
35752_s_at	79	M15036	Hs.64016	protein S (alpha)	-1.42	-2.03	.	0.000865
64369_s_at	80	AA219354	Hs.282804	ceruloplasmin (ferroxidase)	-1.79	-2.31	.	0.000802
260_at	81	M16447	Hs.75438	quinoid dihydropteridine reductase	-1.76	-2.65	.	0.000586
40082_at	82	D10040	Hs.154890	fatty-acid-Coenzyme A ligase, long-chain 2	-1.26	-2.98	.	0.000059
46746_s_at	83	W42636	Hs.5326	porcupine	-1.34	-3.05	.	0.000074

Table 1- Genes Differentially Expressed in Liver Cancer

Fragment Name	Seq. ID	Accession Number	UniGene ID	Description	HCC/CH	HCC/LC	p-Values for HCC/CH	p-Values for HCC/LC
90033_at	84	T66157	Hs.154437	phosphodiesterase 2A, cGMP-stimulated	-2.22	-3.41	.	0.000467
36097_at	85	M62831	Hs.737	immediate early protein	-1.64	-4.02	.	0.000036
74184_at	86	T98839	Hs.30299	IGF-II mRNA-binding protein 2	-1.48	-4.78	.	0.000181
37022_at	87	U41344	Hs.76494	proline arginine-rich end leucine-rich repeat protein	-2.63	-4.89	.	0.000047
58322_at	88	AI765890	Hs.16341	MAWD binding protein	-1.45	-5.43	.	0.000166
65867_at	89	AL043089	Hs.3807	FXYD domain-containing ion transport regulator 6	-1.70	-5.44	.	0.000143
38634_at	90	M11433	Hs.101850	retinol-binding protein 1, cellular	-6.44	-5.51	.	0.00016
38772_at	91	Y11307	Hs.8867	cysteine-rich, angiogenic inducer, 61	-4.09	-5.72	.	0.000487
46694_at	92	AI078144	Hs.9315	HNOEL-iso protein	-4.66	-5.88	.	0.000875
48502_at	93	AA122235	Hs.113052	RNA cyclase homolog	-3.30	-6.27	.	0.000765
64390_at	94	AI342377	Hs.44281	CDK4-binding protein p34SEI1	-2.10	-6.59	.	0.000087
1212_at	95	U86529	Hs.26403	glutathione transferase zeta 1 (maleylacetoacetate isomerase)	-3.51	-7.30	.	0.000367
42363_r_at	96	AI680350	Hs.296176	STAT induced STAT inhibitor 3	-1.71	-7.37	.	0.000016
91311_at	97	AA576961	Hs.82101	pleckstrin homology-like domain, family A, member 1	-2.77	-7.52	.	0.000083
37972_at	98	U75744	Hs.88646	deoxyribonuclease I-like 3	-3.21	-7.76	.	0.000691
1379_at	99	M59371	Hs.171596	epithelial receptor protein-tyrosine kinase	-1.67	-7.95	.	0
35925_at	100	AF040639	Hs.284236	aldo-keto reductase family 7, member A3 (aflatoxin aldehyde reductase)	-2.65	-9.29	.	0.000105
34638_r_at	101	M12963	Hs.73843	alcohol dehydrogenase 1 (class I), alpha polypeptide	-1.85	-9.89	.	0.00081
35556_at	102	K02402	Hs.1330	coagulation factor IX (plasma thromboplastic component, Christmas disease, hemophilia B)	-1.84	-10.42	.	0.00065
41376_i_at	103	J05428	Hs.10319	UDP glycosyltransferase 2 family, polypeptide B7	-3.64	-10.49	.	0.000071
61370_at	104	AI819354	Hs.301528	L-kynurenine/alpha-aminoadipate aminotransferase	-3.46	-10.90	.	0.000621
33564_at	105	L32140	Hs.531	afamin	-1.72	-11.83	.	0.000065
31622_f_at	106	M10943	Hs.203936	metallothionein 1F (functional)	-3.56	-11.84	.	0.000364
35730_at	107	X03350	Hs.4	alcohol dehydrogenase 2 (class I), beta polypeptide	-4.24	-13.10	.	0.000706
37394_at	108	J03507	Hs.78065	complement component 7	-3.50	-15.87	.	0.000247
31623_f_at	109	K01383	Hs.173451	metallothionein 1A (functional)	-5.12	-32.78	.	0.000409

Table 1- Genes Differentially Expressed In Liver Cancer

Fragment Name	Seq. ID	CH/LC	HCC(CH) / HCC(LC)	Mean(CH)	Mean(HCC from CH)	Mean(LC)	Mean(HCC from LC)
Group 1 : HCC/CH and HCC/LC							
33428_s_at	1	-1.35	1.06	36.99	151.48	50.05	142.36
36785_at	2	1.15	-1.12	1300.25	3526.56	1133.51	3956.77
74893_g_at	3	-1.19	-1.09	1381.07	3404.95	1647.94	3710.79
51788_at	4	-1.36	-1.17	725.34	1470.84	987.9	1714.14
44143_at	5	-1.38	-1.27	193.1	319.1	265.76	404.33
832_at	6	1.06	-1.06	151.86	227.89	143.41	242.01
57042_at	7	-1.46	1.03	875.09	485.4	1278.17	472.25
55107_at	8	-1.31	1.33	387.69	203.24	506.63	152.43
33766_at	9	-1.24	1.00	39.13	20	48.58	20
37206_at	10	-2.07	1.12	386.63	190.39	799.12	170.46
37059_at	11	-1.25	3.43	258.26	107.34	322.94	31.33
533_g_at	12	1.54	1.84	192.89	69.68	125.26	37.81
35803_at	13	-2.03	1.11	211.11	58.27	429.09	52.34
33862_at	14	1.00	-1.20	1039.82	243.42	1035.68	291.65
44982_s_at	15	-1.60	1.35	152.67	27.03	244.6	20
32666_at	16	-1.15	-1.14	206.74	31.94	238.32	36.44
35118_at	17	-1.55	2.34	469.05	72.38	728.59	30.93
55063_at	18	-2.08	1.50	494.25	65.7	1028.8	43.7
34602_at	19	-1.33	1.06	260.1	34.51	345.97	32.48
34708_at	20	-1.76	1.31	761.37	80.76	1337.08	61.6
39120_at	21	-2.27	1.56	2259.52	226.61	5124.11	144.85
45943_at	22	-2.46	-1.10	1674.55	140.37	4117.95	154.45
56641_at	23	-3.95	-1.18	4054.26	203.69	16004.11	239.9
Group 2 : HCC/CH							
45313_at	24	-1.53	1.13	158.25	667.72	241.75	590.69
85972_at	25	-1.56	-1.82	24.11	46.33	37.62	84.41
1840_g_at		-1.10	-1.06	353.18	691.4	388.94	730.83
33667_at	26	-1.11	1.15	2848.2	4949.09	3175.61	4297.99
53474_at	27	-1.62	-1.52	246.2	128.65	398.43	195.14

Table 1- Genes Differentially Expressed in Liver Cancer

Fragment Name	Seq. ID	CH/LC	HCC(CH) / HCC(LC)	Mean(CH)	Mean(HCC from CH)	Mean(LC)	Mean(HCC from LC)
34367_at	28	-1.04	-1.55	605.74	149.24	630.02	231.53
38862_at	29	-1.14	-1.38	93.76	25.12	106.98	34.66
40325_at	30	1.14	1.43	211	83.67	185.74	58.46
32727_at	31	1.17	-1.12	89.92	20	77.01	22.5
37319_at	32	-1.02	-1.46	2159.87	404.88	2196.02	591.49
35063_at	33	-1.25	1.66	423.71	106.19	529.69	63.87
1391_s_at	34	-1.48	5.71	1096.07	622.87	1625.85	109.13
32966_at	35	-1.42	1.82	371.31	58.66	525.9	32.26
Group 3 : HCC/LC							
37482_at	36	-2.68	-6.18	30.34	357.74	81.37	2212.61
33404_at	37	1.27	-2.36	25.3	65.78	20	155.35
63545_at	38	1.15	-1.68	52.84	196.23	45.81	329.84
34390_at	39	-1.12	-1.95	22.56	80.76	25.18	157.82
33873_at	40	1.39	-1.84	83.99	192.42	60.26	354.05
893_at	41	1.49	-1.56	58.78	147.44	39.34	230.06
59749_at	42	2.80	-1.53	100.08	120.75	35.71	184.96
39749_at	43	1.04	-2.34	108.86	219.04	104.32	511.93
44695_at	44	1.71	-1.01	34.2	92.53	20	93.12
43836_s_at	45	1.15	-1.92	484.14	924.31	422.21	1775.62
39801_at	46	1.15	-1.08	157.64	524.07	137.41	564.88
44219_at	47	1.32	-2.06	173.41	250.32	131.61	515.98
37256_at	48	1.32	-1.59	46.64	83.47	35.25	132.39
37399_at	49	-1.23	-1.83	642.62	1628.75	791.81	2974.46
35820_at	50	1.78	1.01	91.39	192.04	51.31	189.52
1100_at	51	-1.07	-1.03	41.77	157.11	44.84	161.26
146_at	52	1.11	-1.61	45.26	86.08	40.62	138.85
77990_at	53	1.31	-1.47	92.53	163.29	70.82	240.01

Table 1- Genes Differentially Expressed in Liver Cancer

Fragment Name	Seq. ID	CH/LC	HCC(CH)/ HCC(LC)	Mean(CH)	Mean(HCC from CH)	Mean(LC)	Mean(HCC from LC)
32799_at	54	1.13	-1.59	201.78	365.98	179.36	582.69
32260_at	55	1.17	-1.26	215.21	460.32	183.36	581.74
497_at	56	1.04	-1.53	163.55	323.01	157.23	493.58
33154_at	57	-1.01	-1.92	476.51	771.16	481.66	1481.48
39062_at	58	-1.01	-1.42	323.59	705.43	328.02	1000.16
56378_at	59	1.10	-1.89	586.6	847.94	530.86	1603.61
45155_at	60	1.39	1.01	509.58	1088.23	367.1	1081.19
44082_at	61	1.05	-1.71	145.39	237.67	138.47	407.05
57136_at	62	-1.02	-1.94	856.14	1320.28	873.09	2557.79
64501_at	63	-1.16	-1.59	939.04	1846.8	1086.52	2938.37
34835_at	64	1.02	-1.63	289.56	469.17	284.43	766.35
41322_s_at	65	1.03	-1.34	84.42	159.51	81.92	213.73
44821_at	66	-1.08	-1.43	389.21	762.25	421.21	1088.69
48913_at	67	1.06	-1.60	380.42	575.38	358.46	918.11
35685_at	68	1.64	-1.07	289.35	413.86	176.34	443.67
64886_at	69	-1.48	-2.25	442.13	697.6	654	1568.34
74577_s_at	70	-1.07	-1.44	1553.52	2748.37	1669.16	3966.04
45712_at	71	-1.01	-1.53	336.68	512.07	340.41	782.95
90637_at	72	1.41	-1.15	216.23	302.5	153.02	348.45
1659_s_at	73	1.15	1.04	265.54	526.93	230.24	506.23
38719_at	74	-1.11	-1.17	56.48	114.7	62.54	134.02
37669_s_at	75	-1.03	-1.38	1005.93	1588.92	1034.68	2197.29
45255_at	76	1.15	1.09	1106.18	2205.3	960.49	2029
1309_at	77	-1.20	-1.15	416.77	795.57	500.68	914.19
33659_at	78	-1.00	1.01	1604.43	2635.01	1605.92	2620.97
35752_s_at	79	-1.06	1.34	266.49	187.67	283.7	139.98
64369_s_at	80	-1.23	1.05	1096.17	613.12	1345.19	582.06
260_at	81	-1.50	1.00	330.36	187.35	494.66	186.66
40082_at	82	-2.20	1.07	456.38	360.83	1003.4	336.73
46746_s_at	83	-1.96	1.16	889.16	664.38	1739.7	571.32

Table 1- Genes Differentially Expressed in Liver Cancer

Fragment Name	Seq. ID	CH/LC	HCC(CH) / HCC(LC)	Mean(CH)	Mean(HCC from CH)	Mean(LC)	Mean(HCC from LC)
90033_at	84	-1.09	1.41	596.98	268.41	648.03	190.08
36097_at	85	-1.17	2.09	860.22	522.96	1004.81	249.96
74184_at	86	-2.48	1.30	159.53	107.88	395.36	82.7
37022_at	87	1.25	2.33	315.21	119.91	251.61	51.46
58322_at	88	-2.17	1.72	2508.42	1725.07	5453.68	1004.8
65867_at	89	1.21	3.87	2602.05	1527.55	2143.83	394.41
38634_at	90	1.50	1.28	682.93	106.06	455.03	82.61
38772_at	91	1.12	1.56	193.88	47.36	173.31	30.31
46694_at	92	1.99	2.52	322.34	69.24	161.78	27.53
48502_at	93	-1.64	1.16	935.83	283.76	1535.68	245.08
64390_at	94	-1.68	1.88	269.34	128.48	451.21	68.52
1212_at	95	1.06	2.20	374.12	106.47	352.4	48.29
42363_r_at	96	-3.60	1.19	851	496.58	3065.8	416.23
91311_at	97	-2.98	-1.10	334.15	120.6	994.75	132.35
37972_at	98	-1.34	1.80	450.49	140.24	604.69	77.9
1379_at	99	-3.28	1.45	48.46	29	158.9	20
35925_at	100	-1.96	1.79	163.57	61.72	320.94	34.54
34638_r_at	101	-2.60	2.06	351.38	189.82	912.75	92.25
35556_at	102	-2.34	2.42	621.13	337.88	1452.17	139.35
41376_i_at	103	-2.77	1.04	1104.52	303.33	3061.38	291.7
61370_at	104	-1.76	1.79	161.16	46.57	283.6	26.03
33564_at	105	-2.99	2.29	237.07	137.46	708.95	59.9
31622_f_at	106	-1.89	1.76	3587.58	1009.05	6782.49	572.84
35730_at	107	-1.82	1.69	539.69	127.19	982.94	75.05
37394_at	108	-1.44	3.15	506.19	144.63	728.66	45.9
31623_f_at	109	-1.93	3.31	3516.77	686.61	6798.83	207.38

Table 2: Patient Information

Sample ID	Donor Gender	Donor Race	Donor Age at Excision	Date of Collection	Organ/ Fluid	Tissue Site	Normal or Diseased	Specimen Diagnosis
YUMC-034-01	Male	Korean	42	4/2/2001	Liver	left lobe	Diseased	Liver cirrhosis (HBV)
YUMC-034-02	Male	Korean	42	4/2/2001	Liver	left lobe	Malignant	Hepatoma
YUMC-035-01	Male	Korean	34	1/29/2001	Liver	right lobe	Diseased	Chronic hepatitis B
YUMC-035-02	Male	Korean	34	1/29/2001	Liver	right lobe	Malignant	Hepatoma
YUMC-036-01	Female	Korean	43	2/16/2001	Liver	left lobe	Diseased	Liver cirrhosis (HBV)
YUMC-036-02	Female	Korean	43	2/16/2001	Liver	left lobe	Malignant	Hepatoma
YUMC-037-01	Female	Korean	65	2/14/2001	Liver	right lobe	Diseased	Chronic hepatitis B
YUMC-037-02	Female	Korean	65	2/14/2001	Liver	right lobe	Malignant	Hepatoma
YUMC-038-01	Male	Korean	37	2/21/2001	Liver	right lobe	Diseased	Liver cirrhosis (HBV)
YUMC-038-02	Male	Korean	37	2/21/2001	Liver	right lobe	Malignant	Hepatoma
YUMC-039-01	Male	Korean	62	4/5/2001	Liver	right lobe	Diseased	Liver cirrhosis (HBV)
YUMC-039-02	Male	Korean	62	4/5/2001	Liver	right lobe	Malignant	Hepatoma
YUMC-040-01	Male	Korean	40	3/30/2001	Liver	right lobe	Diseased	Liver cirrhosis (HBV)
YUMC-040-02	Male	Korean	40	3/30/2001	Liver	right lobe	Malignant	Hepatoma
YUMC-042-01	Male	Korean	61	12/18/2000	Liver	left lobe	Diseased	Chronic hepatitis B
YUMC-042-02	Male	Korean	61	12/18/2000	Liver	left lobe	Malignant	Hepatoma
YUMC-043-01	Male	Korean	63	3/27/2001	Liver	left lobe	Diseased	Chronic hepatitis B
YUMC-043-02	Male	Korean	63	3/27/2001	Liver	left lobe	Malignant	Hepatoma
YUMC-059-01	Male	Korean	62	3/26/2001	Liver	right lobe	Diseased	chronic hepatitis B
YUMC-059-02	Male	Korean	62	3/26/2001	Liver	right lobe	Malignant	hepatocellular carcinoma

44

What is claimed is:

1.   A method of diagnosing liver cancer in a patient, comprising:

        (a) detecting the level of expression in a tissue sample of one or more genes from Table 1; wherein differential expression of the genes in Table 1 is indicative of liver

5   cancer.

2.   A method of detecting the progression of liver cancer in a patient, comprising:

        (a) detecting the level of expression in a tissue sample of one or more genes from Table 1; wherein differential expression of the genes in Table 1 is indicative of liver cancer progression.

10   3.   A method of monitoring the treatment of a patient with liver cancer, comprising:

        (a)   administering a pharmaceutical composition to the patient;

        (b)   preparing a gene expression profile of one or more of the genes in Table 1 from a cell or tissue sample from the patient; and

        (c)   comparing the patient gene expression profile to a gene expression profile

15   from a cell population selected from the group consisting of non-cancerous liver cells and cancerous liver cells.

4.   A method of treating a patient with liver cancer, comprising:

        (a)   administering to the patient a pharmaceutical composition;

        (b)   preparing a gene expression profile of one or more of the genes in Table 1

20   from a cell or tissue sample from the patient; and

        (c)   comparing the patient expression profile to a gene expression profile selected from the group consisting of non-cancerous liver cells and cancerous liver cells.

5.   A method of typing liver disease in a patient, comprising:

        (a) detecting the level of expression in a tissue sample of one or more genes from

25   Table 1; wherein differential expression of the genes in Table 1 is indicative of a type of liver disease selected from a group consisting of chronic hepatitis with hepatic carcinoma and cirrhosis with hepatic carcinoma.

6.   A method of detecting the presence or progression of liver cancer in a patient with chronic hepatitis, comprising:

45

(a) detecting the level of expression in a tissue sample of one or more genes from Table 1; wherein differential expression of the genes in Table 1 is indicative of chronic hepatitis with liver cancer.

7.   A method of detecting the presence or progression of liver cancer in a patient with cirrhosis, comprising:

(a) detecting the level of expression in a tissue sample of one or more genes from Table 1; wherein differential expression of the genes in Table 1 is indicative of cirrhosis with liver cancer.

8.   A method of diagnosing liver cancer according to claim 1, wherein the liver cancer is accompanied by chronic hepatitis or cirrhosis.

9.   A method of differentiating liver cancer related to chronic hepatitis from liver cancer related to cirrhosis in a patient, comprising:

(a) detecting the level of expression in a tissue sample of one or more genes from Table 1; wherein differential expression of the genes in Table 1 is indicative of either liver cancer related to chronic hepatitis or liver cancer related to cirrhosis.

10.   A method of screening for an agent capable of modulating the onset or progression of liver cancer, comprising:

(a)   preparing a first gene expression profile of a cell population comprising cancerous liver cells, wherein the expression profile comprises the expression level of one or more genes from Table 1;

(b)   exposing the cell population to the agent;

(c)   preparing second gene expression profile of the agent-exposed cell population; and

(d)   comparing the first and second gene expression profiles.

11.   The method of claim 10, wherein the liver cancer is chronic hepatitis with liver cancer.

12.   The method of claim 10, wherein the liver disease is cirrhosis with liver cancer.

13.   A composition comprising at least two oligonucleotides, wherein each of the oligonucleotides comprises a sequence that specifically hybridizes to a gene in Table 1.

14.   A composition according to claim 13, wherein the composition comprises at least 3 oligonucleotides.

15.   A composition according to claim 13, wherein the composition comprises at least 5 oligonucleotides.

16.   A composition according to claim 13, wherein the composition comprises at least 7 oligonucleotides.

17.   A composition according to claim 13, wherein the composition comprises at least 10 oligonucleotides.

18.   A composition according to any one of claims 13-17, wherein the oligonucleotides are attached to a solid support.

19.   A composition according to claim 18, wherein the solid support is selected from a group consisting of a membrane, a glass support, a filter, a tissue culture dish, a polymeric material, a bead and a silica support.

20.   A solid support comprising at least two oligonucleotides, wherein each of the oligonucleotides comprises a sequence that specifically hybridizes to a gene in Table 1.

21.   A solid support according to claim 20, wherein the oligonucleotides are covalently attached to the solid support.

22.   A solid support according to claim 20, wherein the oligonucleotides are non-covalently attached to the solid support.

23.   A solid support according to claim 20, wherein the support comprises at least about 10 different oligonucleotides in discrete locations per square centimeter.

24.   A solid support according to claim 20, wherein the support comprises at least about 100 different oligonucleotides in discrete locations per square centimeter.

25.   A solid support according to claim 20, wherein the support comprises at least about 1000 different oligonucleotides in discrete locations per square centimeter.

26.   A solid support according to claim 20, wherein the support comprises at least about 10,000 different oligonucleotides in discrete locations per square centimeter.

27.   A computer system comprising:

    (a) a database containing information identifying the expression level in liver tissue of a set of genes comprising at least one gene in Table 1; and

    (b) a user interface to view the information.

28.   A computer system of claim 27, wherein the database further comprises sequence information for the genes.

29.   A computer system of claim 27, wherein the database further comprises information identifying the expression level for the genes in normal liver tissue.

30.   A computer system of claim 27, wherein the database further comprises information identifying the expression level for the genes in tissue from a hepatic carcinoma.

31.   A computer system of claim 30, wherein the hepatic carcinoma is from a patient with chronic hepatitis.

32.   A computer system of claim 30, wherein the hepatic carcinoma is from a patient with cirrhosis.

33.   A computer system of any of claims 27-32, further comprising records including descriptive information from an external database, which information correlates said genes to records in the external database.

34.   A computer system of claim 33, wherein the external database is GenBank.

35.   A method of using a computer system of any one of claims 27-34 to present information identifying the expression level in a tissue or cell of at least one gene in Table 1, comprising:

48

(a) comparing the expression level of at least one gene in Table 1 in the tissue or cell to the level of expression of the gene in the database.

36.   A method of claim 35, wherein the expression level of at least two genes are compared.

37.   A method of claim 35, wherein the expression level of at least five genes are compared.

38.   A method of claim 35, wherein the expression level of at least ten genes are compared.

39.   A method of claim 35, further comprising displaying the level of expression of at least one gene in the tissue or cell sample compared to the expression level in liver disease.

40.   A method of claim 39, wherein the liver disease is hepatic carcinoma, chronic hepatitis or cirrhosis.

41. A therapeutic agent for slowing or halting the progression of liver cancer, wherein the agent is selected from the group consisting of the genes in Table 1, functional fragments of the genes in Table 1, proteins encoded by the genes in Table 1 and functional fragments of said proteins.

42. A method of treating a patient with liver cancer, comprising:

(a)   administering to a patient with liver cancer a pharmaceutical composition comprising all or a portion of at least one gene in Table 1, or a protein encoded therein.

SEQUENCE LISTING

<110> KOH, Sang Seok
        LIU, Qing
        CHUNG, Hyun-Ho
        ZENG, Wen
        LEE, Bogman
        YERRAMILLI, Subrahmanyam
        SONG, Si Young
        Gene Logic, Inc.
        LG Chem Ltd.

<120> GENE EXPRESSION PROFILES IN LIVER DISEASE

<130> 44921-5109-WO

<150> US 60/341,815
<151> 2001-12-21

<150> US 60/343,185
<151> 2001-12-31

<160> 109

<170> PatentIn Ver. 2.1

<210> 1
<211> 3597
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AF034957

<400> 1
atggtggccg cagcggcggc aactgaggca aggctgagga ggaggacggc ggcgacggca 60
gcgctcgcgg gcaggagcgg cgggccgcac tgtgtcaacg gcggtcgctg caaccctggc 120
accggccagt gcgtctgccc cgccggctgg gtgggcgagc aatgccagca ctgcgggggc 180
cgcttcagac taactggatc ttctgggttt gtgacagatg gacctggaaa ttataaatac 240
aaaacgaagt gcacgtggct cattgaagga cagccaaata gaataatgag acttcgtttc 300
aatcattttg ctacagagtg tagttgggac catttatatg tttatgatgg ggactcaatt 360
tatgcaccgc tagttgctgc atttagtggc ctcattgttc ctgagagaga tggcaatgag 420
actgtccctg aggttgttgc cacatcaggt tatgccttgc tgcatttttt tagtgatgct 480
gcttataatt tgactggatt taatattact tacagttttg atatgtgtcc aaataactgc 540
tcaggccgag gagagtgtaa gatcagtaat agcagcgata ctgttgaatg tgaatgttct 600
gaaaactgga aggtgaagc atgtgacatt cctcactgta cagacaactg tggtttttcct 660
catcgaggca tctgcaattc aagtgatgtc agaggatgct cctgcttctc agactggcag 720
ggtcctggat gttcagttcc tgtaccagct aaccagtcat tttggactcg agaggaatat 780
tctaacttaa agctccccag agcatctcat aaagctgtgg tcaatggaaa cattatgtgg 840
gttgttggag atatatgtt caaccactca gattataaca tggttctagc gtatgacctt 900
gcttctaggg agtggcttcc actaaaccgt tctgtgaaca atgtggttgt tagatatggt 960
cattctttgg cattatacaa ggataaaatt tacatgtatg gaggaaaaat tgattcaact 1020
gggaatgtga ccaatgagtt gagagttttt cacattcata atgagtcatg ggtgttgttg 1080
accccctaagg caaaggagca gtatgcagtg gttgggcact ctgcacacat tgttacactg 1140
aagaatggcc gagtggtcat gctggtcatc tttggtcact gccctctcta tggatatata 1200
agcaatgtgc aggaatatga tttggataag aacacatgga gtatattaca cacccagggt 1260
gcccttgtgc aaggggggtta cggccatagc agtgtttacg accataggac caggggccta 1320
tacgttcatg gtggctacaa ggctttcagt gccaataagt accggcttgc agatgatctc 1380
taccgatatg atgtggatac ccagatgtgg accattctta aggacagccg attttttccgt 1440
tacttgcaca cagctgtgat agtgagtgga accatgctgg tgtttggggg aaacacacac 1500
aatgacacat ctatgagcca tggcgccaaa tgcttctctt cagatttcat ggcctatgac 1560

1

```
attgcctgtg accgctggtc agtgcttccc agacctgatt ccaccatgat gtcaacagat 1620
ttggccattc cagcagtctt acacaacagc accatgtatg tgttcggtgg tttcaatagt 1680
ctcctcctca gcgacatcct ggtattcacc tcggaacagt gtgatgcgca tcggagtgaa 1740
gccgcttgtt tagcagcagg acctggtatt cggtgtgtgt ggaacacagg gtcgtctcag 1800
tgtatctcgt gggcgctggc aactgatgaa caagaagaaa agttaaaatc agaatgtttt 1860
tccaaaagaa ctcttgacca tgacagatgt gaccagcaca cagattgtta cagctgcaca 1920
gccaacacca atgactgcca ctggtgcaat gaccattgtg tccccaggaa ccacagctgc 1980
tcagaaggcc agatctccat ttttaggtat gagaattgcc caaggataa ccctatgtac 2040
tactgtaaca agaagaccag ctgcaggagc tgtgccctgg accagaactg ccagtgggag 2100
cccccggaatc aggagtgcat tgccctgccc gaaaatatct gtggcattgg ctggcatttg 2160
gttggaaact catgtttgaa aattactact gccaaggaga attatgacaa tgctaaattg 2220
ttctgtagga accacaatgc ccttttggct tctcttacaa cccagaagaa ggtagaattt 2280
gtccttaagc agctgcgaat aatgcagtca tctcagagca tgtccaagct caccttaacc 2340
ccatgggtcg gccttcggaa gatcaatgtg tcctactggt gctgggaaga tatgtccccca 2400
tttacaaata gtttactaca gtggatgccg tctgagccca gtgatgctgg attctgtgga 2460
attttatcag aacccagtac tcggggactg aaggctgcaa cctgcatcaa cccactcaat 2520
ggtagtgtct gtgaaaggcc tgcaaaccac agtgctaagc agtgccggac accatgtgcc 2580
ttgaggacag catgtggaga ttgcaccagc ggcagctctg agtgcatgtg gtgcagcaac 2640
atgaagcagt gtgtggactc caatgcctat gtggcctcct ccctttttgg ccagtgtatg 2700
gaatggtata cgatgagcac ctgcccccct gaaaattgtt caggctactg tacctgtagt 2760
cattgcttgg agcaaccagg ctgtggctgg tgtactgatc ccagcaatac tggcaaaggg 2820
aaatgcatag agggttccta taaaggacca gtgaagatgc cttcgcaagc ccctacagga 2880
aatttctatc cacagcccct gctcaattcc agcatgtgtc tagaggacag cagatacaac 2940
tggtctttca ttcactgtcc agcttgccaa tgcaacggcc acagtaaatg catcaatcag 3000
agcatctgtg agaagtgtga gaacctgacc acaggcaagc actgcgagac ctgcatatct 3060
ggcttctacg gtgatcccac caatggaggg aaatgtcagc catgcaagtg caatgggcac 3120
gcgtctctgt gcaacaccaa cacgggcaag tgcttctgca ccaccaaggg cgtcaagggg 3180
gacgagtgcc agctatgtga ggtagaaaat cgataccaag gaaaccctct cagaggaaca 3240
tgttattata ctcttcttat tgactatcag ttcacctta gtctatccca ggaagatgat 3300
cgctattaca cagctatcaa ttttgtggct actcctgacg aacaaaacag ggatttggac 3360
atgttcatca atgcctccaa gaatttcaac ctcaacatca cctgggctgc cagtttctca 3420
gctggaaccc aggctggaga agagatgcct gttgtttcaa aaaccaacat taaggagtac 3480
aaagatagtt tctctaatga gaagtttgat tttcgcaacc acccaaatat cactttcttt 3540
gtttatgtca gtaatttcac ctggcccatc aaaattcagg tgcaaactga acaatga    3597
```

<210> 2
<211> 1231
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. Z23090

<400> 2
```
gagggaactg gtaatagaat ttattcaaat gtgccttaat ataggcgctg gggcttgccc 60
atggtgctct tgatatataa ggcccggaca ttctgccagt tttcttgag caatgacacc 120
aagaagttga cagccaggtg aatgttatac acaagctcat cgtctgtcat cttcacgtga 180
ccaacagcta cagccagaca taacaccttc ttcatttgga acttgattgt ggacttcacc 240
tcatccactt tggccaccat gttttcgttg tgtgtgagca gggaagggaa ctttcctgcc 300
ttatttaaac ctgggccgag gattcgtgga atctgcttga tcagagactc tgaggccaaa 360
acgcatcata cttcttggcc agcttcttga ccagtttttt attcttgttg agtttttttca 420
gcgcctcgat gtccatgtgg gggatatcca cggccttagc ctcgtcaaga cccacaccag 480
agtcagccag catgaccgag cgccgcgtcc ccttctcgct cctgcggggc cccagctggg 540
accccttccg cgactggtac ccgcatagcc gcctcttcga ccaggccttc gggctgcccc 600
ggctgccgga ggagtggtcg cagtggttag cggcagcag ctggccaggc tacgtgcgcc 660
cctgccccc cgccgccatc gagagccccg cagtggccgc gcccgcctac agccgcgcgc 720
tcagccggca actcagcagc ggggtctcgg agatccggca cactgcggac cgctggcgcg 780
tgtccctgga tgtcaaccac ttcgccccgg acgagctgac ggtcaagacc aaggatggcg 840
tggtggagat caccggcaag cacgaggagc ggcaggacga gcatggctac atctcccggt 900
gcttcacgcg gaaatacacg ctgcccccg gtgtggaccc cacccaagtt cctcctcccc 960
tgtcccctga gggcacactg accgtggagg cccccatgcc caagctagcc acgcagtcca 1020
```

```
acgagatcac catcccagtc accttcgagt cgcgggccca gcttgggggc ccagaagctg 1080
caaaatccga tgagactgcc gccaagtaaa gccttagccc ggatgcccac ccctgctgcc 1140
gccactggct gtgcctcccc cgccacctgt gtgttctttt gatacattta tcttctgttt 1200
ttctcaaata aagttcaaag caaccacctg t                                1231
```

```
<210> 3
<211> 488
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AA928646

<220>
<221> unsure
<222> (1)..(488)
<223> n = a or c or g or t

<400> 3
tgggtatttc actttattta gcaaacggtc acactcggcc ccaccacacc gcgcctgcag 60
cctcacttga gcatctgtct caggaagcag ctcagggtga acaggaaggc ctgggtttcc 120
cagttcaggc cttatccgtc gccacacgtg ccacacacca caaaacaaaa tcacttcccc 180
acgtcctcag gagcccaccc cagtgtggtc cggggacgc tccagtgttc aacagctgcc 240
tgcagggcc acagccagtc tgtagacaca ggccctggca cgaggcggtc ccgggtgtac 300
cacaaggcga tgcgtnctcc atggaggttc ttcttccctg tgccgtggac tttgaagtgg 360
acgtgcattt cccagtcttt gaggaagcac ggctggtggt tccagataga gccctctttg 420
ctgcgcccgt caggggtcag acgtacgtac tggctcgtga gcatagtgct gccctggaag 480
ttccagag                                                          488
```

```
<210> 4
<211> 521
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AW023096

<220>
<221> unsure
<222> (1)..(521)
<223> n = a or c or g or t

<400> 4
gcacgagccc agcccgagtt atgcctgccc agcttaaggt cctaaccatg ccggagacct 60
gtngatacca gcctttnaaa ccactctcta ttggaggcat catcattctg aaggatacca 120
gtgaanacat tgaggagctg gtggaacctg tggcagcaca tggcccaaaa atcgaggagg 180
aggaacaaga gccagaaccc ccagaaccat ttgagtatat tgatgattaa nggccagagg 240
atctcacttg cttatctgaa gaagattgtc caggctcata ttgggaatgc ttatgaggaa 300
attcatgccg agacctgcta ttcaatgcat gtatcgttgc ctctgcactg acctgaagaa 360
ccctgtcttc caagtctttt ggttgaaaga gaagatatan tgactgttng agttgtggct 420
cttttacaag aaacnttngn ntttcaaata aatattaaag atctttccng atggacnngg 480
aaaaanatta aacacttatt ttcctcgagg ggggggccc c                      521
```

```
<210> 5
<211> 619
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AA399076
```

```
<400> 5
caactagggg gaaaacactt taggttgagt gctgagagaa aggctctctg agtaggtgac 60
atctgaacta agagctgaag cagaagaata agccatcctc tgtggaccaa aggggacaag 120
attctctact tttctgctac gcactaggaa tatagcagag aagacaagtg gctgctacct 180
tctgttatcg tgggtggcag tgactagttt ttctagatct tgactccctg ccgtaactaa 240
agatggagta cactgatgct gaagtactat gagccttcgg aacttgtgga gagactacaa 300
agttttggtt gttatggtcc ctttagttgg gctcatacat ttggggtggt acagaatcaa 360
aagcagccct gttttccaaa tacctaaaaa cgacgacatt cctgagcaag atagtctggg 420
actttcaaat cttcagaaga gccaaatcca ggggaagtag caggcttgca atcttcaggt 480
aaagaagcag ctttgaatct gagcttcata tcgaaagaag agatgaaaaa taccagttgg 540
attagaaaga actggcttct tgtagctggg atatctttca taggtgtcca tcttggaaca 600
tactttttgc agaggtctg                                                 619


<210> 6
<211> 509
<212> DNA
<213> Homo sapiens


<220>
<223> Genbank Accession No. U39317


<400> 6
gcacgggtca ccgcatcaca ccatggctct gaagagaatc cacaaggaat tgaatgatct 60
ggcacgggac cctccagcac agtgttcagc aggtcctgtt ggagatgata tgttccattg 120
gcaagctaca ataatggggc caaatgacag tccctatcag ggtggagtat ttttcttgac 180
aattcatttc ccaacagatt accccttcaa accacctaag gttgcattta caacaagaat 240
ttatcatcca aatattaaca gtaatggcag catttgtctt gatattctac gatcacagtg 300
gtctccagca ctaactattt caaaagtact cttgtccatc tgttctctgt tgtgtgatcc 360
caatccagat gatcctttag tgcctgagat tgctcggatc tacaaaacag atagagaaaa 420
gtacaacaga atagctcggg aatggactca gaagtatgcg atgtaattaa acaaattatt 480
ggataacctc tacaaataaa gatagggga                                      509


<210> 7
<211> 591
<212> DNA
<213> Homo sapiens


<220>
<223> Genbank Accession No. W74749


<220>
<221> unsure
<222> (1)..(591)
<223> n = a or c or g or t


<400> 7
gatagtaaaa taattttatt tagtttctta ttttaaaaaa ggtagcattt caacatataa 60
atttagactc aagattacag tgtatatttg ccaaaaggaa caccccgaaa gacggccagc 120
ctcagagctg agagggcaca gggaggcaca ctcctcacac atggagttta agcagaagtg 180
ctttaagact tcacagcggc atttccctgt tcctcagccc cgcctccagg gccatcactt 240
tggggcaaca gcttttgctc atgtaactat aaaacatctc taggaatgaa agcacagagg 300
tcaatgatcc agattttcca caacaatcat ctgcagcaac aattcgacag gtaaagattt 360
tattttata attcaaaagt tcttttaagg agaactaaag aacacaaaat tcatttataa 420
agagatttat agaattaaat ggagccaaaa tggaaaaatt attttcccca tattaccaat 480
ggcctctata nggataaggn ccagggggga agacccattt ccaatctggg ctttcccttc 540
cccaataagt gttttgggca caacccacaa ctggtcatga gctgncaggc c           591


<210> 8
<211> 532
<212> DNA
<213> Homo sapiens
```

<220>
<223> Genbank Accession No. AI916306

<400> 8
```
ttaccaattt aataaatgta ctgtattaac atgaagacta atgacaaatg cactgcagta 60
gtaagcacgt catagatgca tagaatattc tctatatagt ctgaatatgg atataaaata 120
agttatactc attttgtttt ccatcacagt aggagcatag catacaaagt gattggttca 180
gtggccatga agcaagccag gggagagacc acagaagaga atgtagggca ttgagtacag 240
tggggatttg ccaaggacac tgcagagtcc ctggggaccc tctggggaac aaggccccaa 300
acctctcaag ttagccttct gagaatagta tgaggtccca cttgacaaga gacagtggct 360
gcatctgagc tgggatgatt caggcaactg ggtgggaggc agagcaggga caggcacgaa 420
cagcatccag caggctagcc cactctcctg ctggtgctgt tggatgtcta tgatgctggg 480
aatatggggc gcagagccag aaggcacggt ttgcttctgt gacgtgacag at 532
```

<210> 9
<211> 2834
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. X77777

<400> 9
```
tcggagcctg cggagggtgg tggtggtggt ggtggtggcc ctcgcccgcc tcactcatgc 60
ctcctcctcc tctgctctcg ctcaggcgcc tcggtggcgg ttggtcggcg gttacgcggc 120
tggtggtcgc ggcggccggg gctcgctctc ggggaggccg gggcggatct cgcggcgcag 180
gcggcggcgg ccgaggtggg gtcgcgcggc ggaggcggct cgagcttcgt gctgcgcgct 240
cgctcttggg ctcctcgctg caggaggagt gtgactatgt gcagatgatc gaggtgcagc 300
acaagcagtg cctggaggag gcccagctgg agaatgagac aataggctgc agcaagatgt 360
gggacaacct cacctgctgg ccagccaccc ctcggggcca ggtagttgtc ttggcctgtc 420
ccctcatctt caagctcttc tcctccattc aaggccgcaa tgtaagccgc agctgcaccg 480
acgaaggctg gacgcacctg gagcctggcc cgtaccccat tgcctgtggt ttggatgaca 540
aggcagcgag tttggatgag cagcagacca tgttctacgg ttctgtgaag accggctaca 600
ccattggcta cggcctgtcc ctcgccaccc ttctggtcgc cacagctatc ctgagcctgt 660
tcaggaagct ccactgcacg cggaactaca tccacatgca cctcttcata tccttcatcc 720
tgagggctgc cgctgtcttc atcaaagact tggccctctt cgacagcggg gagtcggacc 780
agtgctccga gggctcggtg ggctgtaagg cagccatggt cttttttccaa tattgtgtca 840
tggctaactt cttctggctg ctggtggagg gcctctacct gtacaccctg cttgccgtct 900
ccttcttctc tgagcggaag tacttctggg ggtacatact catcggctgg ggggtaccca 960
gcacattcac catggtgtgg accatcgcca ggatccattt tgaggattat ggtctgctca 1020
ggtgctggga caccatcaac tcctcactgt ggtggatcat aaagggcccc atcctcacct 1080
ccatcttggt aaacttcatc ctgtttattt gcatcatccg aatcctgctt cagaaactgc 1140
ggccccagat tatcaggaag agtgacagca gtccatactc aaggctagcc aggtccacac 1200
tcctgctgat cccctgtttt ggagtacact acatcatgtt cgccttcttt ccggacaatt 1260
ttaagcctga agtgaagatg gtctttgagc tcgtcgtggg gtctctccag ggttttgtgg 1320
tggctatcct ctactgcttc ctcaatggtg aggtgcaggc ggagctgagg cggaagtggc 1380
ggcgctggca cctgcagggc gtcctgggct ggaaccccaa ataccggcac ccgtcgggag 1440
gcagcaacgg cgccacgtgc agcacgcagg tttccatgct gaccgcgtc agcccaggtg 1500
cccgccgctc ctccagcttc caagccgaag tctccctggt ctgaccacca ggatcccagc 1560
ccaagcggcc cctcccgccc cttccactc gcagcagacg ccggggacag aggcctgccc 1620
gggcgcgcca gccccggccc tgggctcgga ggctgccccc ggccccctgg tctctggtcc 1680
ggacactcct agagaacgca gccctagagc ctgcctggag cgtttctagc aagtgagaga 1740
gatgggagct cctctcctgg aggatgcagg tggaactcag tcattagact cctcctccaa 1800
aggcccccta cgccaatcaa gggcaaaaag tctacatact ttcatcctga ctctgccccc 1860
tgctggctct tctgcccaat tggaggaaag caaccggtgg atcctcaaac aacactggtg 1920
tgacctgagg gcagaaaggt tctgcccggg aaggtcacca gcaccaacac cacggtagtg 1980
cctgaaattt caccattgct gtcaagttcc tttgggttaa gcattaccac tcaggcattt 2040
gactgaagat gcagctcact accctattct ctctttacgc ttagttatca gcttttaaa 2100
gtgggttatt ctggagtttt tgtttggaga gcacacctat cttagtggtt ccccaccgaa 2160
gtggactggc ccctgggtca gtctggtggg aggacggtgc aacccaagga ctgagggact 2220
```

```
ctgaagcctc tgggaaatga gaaggcagcc accagcgaat gctaggtctc ggactaagcc 2280
tacctgctct ccaagtctca gtggcttcat ctgtcaagtg ggactctgtc acaccagcca 2340
ttcttatctc tctgtgctgt ggaagcaaca ggaatcaaga gactgccctc cttgtccacc 2400
cacctatgtg ccaactgttg taactaggct cagagatgtg cacccatggg ctctgacaga 2460
aagcagatcc tcaccctgct acacatacag gatttgaact cagatctgtc tgataggaat 2520
gtgaaagcac ggactcttac tgctaacttt tgtgtatcgt aaccagccag atcctcttgg 2580
ttatttgttt accacttgta ttattaatgc cattatccct gaattcccct tgccacccca 2640
ccctccctgg agtgtggctg aggaggcctc catctcatgt atcatctgga taggagcctg 2700
ctggtcacag cctcctctgt ctgcccttca ccccagtggc cactcagctt cctacccaca 2760
cctctgccag aagatccct caggactgca acaggcttgt gcaacaataa atgttggctt 2820
ggaaaaaaaa aaaa                                                   2834
```

<210> 10
<211> 2799
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. X63359

<400> 10
```
ctgcacaagg atggctctga aatggactac agttctgctg atacaactca gttttttactt 60
tagctctggg agttgtggaa aggtgctggt atgggccgca gaatacagcc tttggatgaa 120
tatgaagaca tcctgaaag aacttgttca gagaggtcat gaggtgactg tactggcatc 180
ttcagcttcc attcttttg atcccaacga ctcatccact cttaaacttg aagtttatcc 240
tacatcttta actaaaactg aatttgagaa tatcatcatg caattggtta agagattgtc 300
agaaattcaa aaagatacat tttggttacc tttttcacaa gaacaagaaa tcctgtgggc 360
aattaatgac ataattagaa acttctgtaa agatgtagtt tcaaataaga aacttatgaa 420
aaaactacaa gagtcaagat ttgacatcgt ttttgcagat gcttatttac cctgtggtga 480
gctgctggct gagctatta acatacccct tgtgtacagt cacagcttca gtcctggcta 540
ctcatttgaa aggcacagtg gaggatttat tttcctcct tcctacgtac ctgttgttat 600
gtcaaaatta agtgatcaaa tgactttcat ggagagggta aaaaatatgc tctatgtgct 660
ttattttgac ttttggttcc aaatatttaa tatgaagaag tgggatcagt tttacagtga 720
agttttagga agacccacta cattatctga gacaatgagg aaagctgaca tatggcttat 780
gcgaaactcc tggaatttta aatttcctca tccattctta ccaaatgttg attttgttgg 840
aggactccac tgcaaacctg ccaaacccct acctaaggaa atggaggagt ttgtacagag 900
ctctggagaa aatggtgttg tggtgtttc tctggggtca atggtcagta acatgacaga 960
agaaagggcc aacgtaattg caacagccct tgccaagatc ccacaaaagg ttctttggag 1020
atttgatggg aataaaccag atgccttagg tctcaatact cgactgtaca agtggatacc 1080
ccagaatgac cttctaggtc atccaaaaac cagagctttt ataactcatg gtggagccaa 1140
tggcatctat gaggcaatct accatgggat ccctatggtg ggcattccat tgttttttga 1200
tcaacctgat aatattgctc acatgaaggc caagggagca gctgttagag tggacttcaa 1260
cacaatgtcg agtacagacc tgctgaatgc actgaagaca gtaattaatg atccttcata 1320
taaagagaat attatgaaat tatcaagaat tcaacatgat caaccagtga gcccctgga 1380
tcgagcagtc ttctggattg aatttgtcat gcgccacaaa ggagccaaac atcttcgagt 1440
tgcagcccac aacctcacct ggttccagta ccactctttg gatgtgattg ggttcctgct 1500
ggcttgtgtg gcaaccgtgc tatttatcat cacaaagtgt gtctgttttt gtttctggaa 1560
gtttgctaga aaaggaaaga agggaaaag ggattagtta tatctgagat ttgaagctgg 1620
ggaattccgt ttattgaaga ttcaggttaa cctgaatcaa gttaacccag tctcaaatgc 1680
tcacttatcc tatctccttg gcacaaatct ctcctctcct ggattgccaa agaaaattca 1740
aattattctt caattagtca ggatgatttg actatcagca gttcatagta cccatcttca 1800
taactaagcc acctagggat ccggcagaaa aaaaagggat gcaggggagt catcatacag 1860
ggggtggatc atttaccagg atccacactt cctacaaagc ggttgtaata ttaaataaca 1920
aaactgtttt ttattccaat cttcacataa aacaggaata attgtatact ttcttactaa 1980
tgtgttccat ggagtttttc ctccaagaag tggcttaggg gaaaatgagc cccagtaatg 2040
ctctgtggca tccaatcctt ctaccccgac cctttgactt tctgccccag cccctcttag 2100
ttctcctaga attaggacta aggttaagtg ccctcttggg atatgacttc cttcccttcc 2160
tcttgataca aaaagagcct attaccaacc ctcatacaca caagagttcc cttcctagtt 2220
gcagactctt ctgctccagc tggactcccc tagctctgga ctcccactag atcacacagg 2280
ggtccctgca tgtcagtaaa ctttggatga ccttgggaga ccaaaaaatg gaatatcatt 2340
ttttgatcta aacaaatag tttcctgatt taacactggc caggaaggtg ggctgcaccc 2400
```

```
tcagtctctc tctcccatca tggttttcac atgatatcaa aggactctca taacagtctg 2460
attcttatga gttgggcatc ctgtgtttcc ctttagggcc tgcttccttc aaatagagga 2520
gatgggtgct atgaaaccta ttcactctgg acttgggatg gctcttctcc atcttcccaa 2580
gtctgagctg gagcctccat gcccaactct gctctgctct tctatttcct gacagcagct 2640
aaggcatgtt cctgttctgc ccccaaattg accttactaa cagtgagaac ttggaggagt 2700
cttcgggtct tgggaaatcc aagttttccc ggaaacgttt tgttgtaaac agtgtccaca 2760
ctctttgctc caataaagct cggttcctta agggaattc                          2799
```

<210> 11
<211> 2194
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. Z48475

<400> 11

```
gtgaccagag gggtttgtgt ggctgaagag gcaggaggaa cagtgtatcc acagcgtggg 60
accatgccag gcacaaaacg gtttcaacat gtcattgaga ccccggagcc tggcaagtgg 120
gagttgtctg ggtacgaggc agctgtgcca atcacggaga agtcaaaccc actgacccag 180
gatctagaca aagcagatgc tgagaacatt gttcgactgc tagggcaatg tgatgctgag 240
atcttccagg aggaggggca agccctgtcc acataccaga gactctacag cgaatccatt 300
ctgaccacca tggtacaggt ggctgggaaa gttcaggaag tgctgaagga gccagatggg 360
gggctggttg tgctgagtgg aggggggcacc tctggccgga tggcattcct catgtcggtg 420
tcctttaatc agctgatgaa aggtctggga cagaaacctc tttacaccta cctcattgca 480
ggtggtgaca ggtctgtggt ggcctctagg gaggggacag aagatagtgc cttgcacggg 540
attgaggaac tgaagaaggt ggctgccggg aagaagagag tgattgtcat tggcatttct 600
gtgggactct ctgctccctt tgtggcaggc cagatggact gctgcatgaa caacacagct 660
gtcttcttgc cagtcctggt tggcttcaat ccagtgagca tggccagaaa tgaccccatt 720
gaagactgga gttcaacatt ccgacaagta gcagagcgga tgcagaaaat gcaggagaaa 780
cagaaagctt ttgtgctcaa tcctgccatc gggcccgagg gtctcagcgg ctcctcccgg 840
atgaaaggtg gaagtgccac caagattctg ctggaaaccc tgttattagc agcccataag 900
actgtggacc agggcattgc agcatctcaa agatgcctcc tggaaatctt gcggacattt 960
gagcgagctc atcaggtgac ctacagccaa agccccaaga ttgccaccct gatgaagagt 1020
gtcagcacca gtctggagaa gaaaggccac gtgtacctgg ttggctggca gaccctgggt 1080
atcattgcca tcatggatgg agtagagtgc atccacacct ttggtgctga tttccgagat 1140
gtccgtggct ttctcattgg tgatcacagt gacatgttta accagaaggc tgagctcacc 1200
aaccagggtc cccagttcac cttctcccag gaggacttcc cgacttccat ccttccctct 1260
ctcacggaaa tcgatactgt ggtcttcatt ttcaccctgg atgacaacct cacggaggtg 1320
cagactatag tggagcaggt gaaagagaag accaaccaca tccaggccct ggcacacagc 1380
accgtgggtc agaccttgcc gatccctctg aagaagctct ttccctccat catcagcatc 1440
acatggccac tgcttttctt tgaatatgaa gggaacttca tccagaagtt ccagcgtgag 1500
ctaagcacca aatgggtgct gaatacagtg agtacaggtg ctcatgtgct tcttggtaag 1560
atcctacaaa accacatgtt ggaccttcgg attagcaact ccaagctctt ctggcggggcg 1620
ctggccatgc tgcagcggtt ctctggacag tccaaggctc gatgcatcga gagcctcctc 1680
cgagcgatcc actttcccca gccactgtca gatgatattc gggctgctcc catctcctgc 1740
cgtgtccagg ttgcacatga gaaggaacag gtgataccca tcgccttgct gagcctccta 1800
ttccggtgct cgatcactga ggctcaggca cacctggctg cagctccttc tgtctgtgag 1860
gctgtcagga gtgctcttgc tgggccaggt cagaagcgca ctgcggaccc cctcgagatc 1920
ctagagcctg acgttcagtg aacccatgtt tctgggtggg tgaaaggggc caacccctgc 1980
ccacttcagc ccagcccgcc caaggggact tgtgccagca gaacatgtgg gaggaagaag 2040
ccccgtttcc agggcatccg cagcccaggg tagggagaaa tattctctcc actttggggg 2100
agagttcttg ctctcgacct agtggtttct actctcaccg acttattctg atttcagaaa 2160
taaaatgaaa tgtcttattt tggaaaaaaa aaaa                                2194
```

<210> 12
<211> 2171
<212> DNA
<213> Homo sapiens

<220>

<223> Genbank Accession No. U17418

<400> 12
```
tcaacacgtg aattcccaca gaagctgctc agggactatc catggcctcc ccgtggccaa 60
cttgagtctg ctctgcagct ttaggcccga cttggaaggc ccatgggctg cagatgagga 120
aactgaggtc cagacagccg aagagtggta gtgtccagga cacacaactg ggccggcggc 180
ggcggctgcc ccgagggacg cggccctagg cggtggcgat ggggaccgcc cggatcgcac 240
ccggcctggc gctcctgctc tgctgccccg tgctcagctc cgcgtacgcg ctggtggatg 300
cagatgacgt catgactaaa gaggaacaga tcttcctgct gcaccgtgct caggcccagt 360
gcgaaaaacg gctcaaggag gtcctgcaga ggccagccag cataatggaa tcagacaagg 420
gatggacatc tgcgtccaca tcagggaagc ccaggaaaga taaggcatct gggaagctct 480
accctgagtc tgaggaggac aaggaggcac ccactggcag caggtaccga gggcgcccct 540
gtctgccgga atgggaccac atcctgtgct ggccgctggg ggcaccaggt gaggtggtgg 600
ctgtgccctg tccggactac atttatgact tcaatcacaa aggccatgcc taccgacgct 660
gtgaccgcaa tggcagctgg gagctggtgc ctgggcacaa caggacgtgg gccaactaca 720
gcgagtgtgt caaatttctc accaatgaga ctcgtgaacg ggaggtgttt gaccgcctgg 780
gcatgattta caccgtgggc tactccgtgt ccctggcgtc cctcaccgta gctgtgctca 840
tcctggccta ctttaggcgg ctgcactgca cgcgcaacta catccacatg cacctgttcc 900
tgtccttcat gctgcgcgcc gtgagcatct tcgtcaagga cgctgtgctc tactctggcg 960
ccacgcttga tgaggctgag cgcctcaccg aggaggagct gcgcgccatc gcccaggcgc 1020
ccccgccgcc tgccaccgcc gctgccggct acgcgggctg cagggtggct gtgaccttct 1080
tcctttactt cctggccacc aactactact ggattctggt ggaggggctg tacctgcaca 1140
gcctcatctt catggccttc ttctcagaga agaagtacct gtggggcttc acagtcttcg 1200
gctggggtct gcccgctgtc ttcgtggctg tgtgggtcag tgtcagagct accctggcca 1260
acaccgggtg ctgggacttg agctccggga acaaaaagtg gatcatccag gtgcccatcc 1320
tggcctccat tgtgctcaac ttcatcctct tcatcaatat cgtccgggtg ctcgccacca 1380
agctgcggga gaccaacgcc ggccggtgtg acacacggca gcagtaccgg aagctgctca 1440
aatccacgct ggtgctcatg cccctctttg gcgtccacta cattgtcttc atggccacac 1500
catacaccga ggtctcaggg acgctctggc aagtccagat gcactatgag atgctcttca 1560
actccttcca gggattttt gtcgcaatca tatactgttt ctgcaacggc gaggtacaag 1620
ctgagatcaa gaaatcttgg agccgctgga cactggcact ggacttcaag cgaaaggcac 1680
gcagcgggag cagcagctat agctacggcc ccatggtgtc ccacacaagt gtgaccaatg 1740
tcggcccccg tgtgggactc ggcctgcccc tcagcccccg cctactgccc actgccacca 1800
ccaacggcca ccctcagctg cctggccatg ccaagccagg gaccccagcc ctggagaccc 1860
tcgagaccac accacctgcc atggctgctc ccaaggacga tgggttcctc aacggctcct 1920
gctcaggcct ggacgaggag gcctctgggc ctgagcggcc acctgccctg ctacaggaag 1980
agtgggagac agtcatgtga ccaggcgctg ggggctggac ctgctgacat agtggatgga 2040
cagatggacc aaaagatggg tggttgaatg atttcccact cagggcctgg ggccaagagg 2100
aaaaacaggg aaaaaaagaa aaaaaaaag aaagaaaaa aaggaaaaaa aaaaaaaaaa 2160
aaaaaaaaa a                                                    2171
```

<210> 13
<211> 833
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. S82240

<400> 13
```
cagaaattat ccagcaaatc tatcatggat cctaatcaga acgtgaaatg caagatagtt 60
gtggtgggag acagtcagtg tggaaaaact gcgctgctcc atgtcttcgc caaggactgc 120
ttccccgaga attacgttcc tacagtgttt gagaattaca cggccagttt tgaaatcgac 180
acacaaagaa tagagttgag cctgtgggac acttcgggtt ctccttacta tgacaatgtc 240
cgcccctct cttaccctga ttcggatgct gtgctgattt gctttgacat cagtagacca 300
gagaccctgg acagtgtcct caaaaagtgg aaaggtgaaa tccaggaatt ttgtccaaat 360
accaaaatgc tcttggtcgg ctgcaagtct gatctgcgga cagatgttag tacattagta 420
gagctctcca tcacaggca gacgccagtg tcctatgacc aggggggcaaa tatggccaaa 480
cagattggag cagctactta tatcgaatgc tcagctttac agtcggaaaa tagcgtcaga 540
gacatttttc acgttgccac cttggcatgt gtaaataaga caaataaaaa cgttaagcgg 600
aacaaatcac agagagccac aaagcggatt tcacacatgc ctagcagacc agaactctcg 660
```

```
gcagttgcta cggacttacg aaaggacaaa gcgaagagct gcactgtgat gtgaatcttt 720
cattatcttt aatgaagaca aaggaatcta gtgtaaaaaa caacagcaaa caaaaaggtg 780
agtctaaatg aagtgcacag ccaaagtcat gtataccaga ggcttaggag gcg        833
```

<210> 14
<211> 1445
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AF017786

<400> 14
```
gagttggggc tggcgctccg gagttgctgg gctcagcgca gctcccattc attaaggaac 60
cagctgcgga ggaaggtggc cgagcgcccg cgctgcccac tcgctcgctc gcgcactcag 120
acgcgcgcca caacagcgcg ccccaagctg cgcagctctg caaaagtttc tgctcgggat 180
ctggctctct tccccttgga ctttagaacg atttagggtt gacagaggaa agcagaggcg 240
cgcaggagga gcagaaaaca ccaccttctg cagttggagg caggcagccc cggctgcact 300
ctagccgcct gggtgtgtgg ctgctgttgc gggacgtctt cgcggggcgg gaggctcgcg 360
ccgcagccag cgccatgcaa aactacaagt acgacaaagc gatcgtcccg gagagcaaga 420
acggcggcag cccggcgctc aacaacaacc cgaggaggag cggcagcaag cgggtgctgc 480
tcatctgcct cgacctcttc tgcctcttca tggcgggcct ccccttcctc atcatcgaga 540
caagcaccat caagccttac caccgagggt tttactgcaa tgatgagagc atcaagtacc 600
cactgaaaac tggtgagaca ataaatgacg ctgtgctctg tgccgtgggg atcgtcattg 660
ccatcctcgc gatcatcacg ggggaattct accggatcta ttacctgaag aagtcgcggt 720
cgacgattca gaacccctac gtggcagcac tctataagca agtgggctgc ttcctctttg 780
gctgtgccat cagccagtct ttcacagaca ttgccaaagt gtccataggg cgcctgcgtc 840
ctcacttctt gagtgtctgc aaccctgatt tcagccagat caactgctct gaaggctaca 900
ttcagaacta cagatgcaga ggtgatgaca gcaaagtcca ggaagccagg aagtccttct 960
tctctggcca tgcctccttc tccatgtaca ctatgctgta tttggtgcta tacctgcagg 1020
cccgcttcac ttggcgagga gcccggctgc tccggcccct cctgcagttc accttgatca 1080
tgatggcctt ctacacggga ctgtctcgcg tatcagacca caagcaccat cccagtgatg 1140
ttctggcagg atttgctcaa ggagccctgg tggcctgctg catagttttc ttcgtgtctg 1200
acctcttcaa gactaagacg acgctctccc tgcctgcccc tgctatccgg aaggaaatcc 1260
tttcacctgt ggacattatt gacaggaaca atcaccacaa catgatgtag gtgccaccca 1320
cctcctgagc tgttttgta aaatgactgc tgacagcaag ttcttgctgc tctccaatct 1380
catcagacag tagaatgtag ggaaaaactt ttgcccgact gatttttaaa aaaaaaaaaa 1440
aaaaa                                                          1445
```

<210> 15
<211> 388
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI985046

<400> 15
```
ttttttttaca tttcaaatat attttattac tttccatctt agaaagaata tgaaacctgc 60
atgcaatgct aatggtttct gacatgtaca tagcatataa cacagcagta caatgcggca 120
tatactgggg ggcagtgtgt ggaggggggcg ttcttaaggg tatatgtaca gaggaaaggg 180
cgcatggtca tcttagcttt cgaaagagga ctgcactgtt taacattgaa gaattacatg 240
gggaatcaca aatatattgc tttagtactg catgttctgt tgtggtgagg gaaagaaaca 300
tgctttgaag gtttttccctt gtcaacagaa tgtgtgtctg tagctgtgta ttgcgcatgt 360
attcatatat ttttaagttt tctcctaa                                  388
```

<210> 16
<211> 2244
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. U19495

<400> 16
```
gcacgggaca ggccgggcca cacccaccgg ggcgagctcg gagggcggcg ctctgggcgg 60
agggcccggc ggctcggccc agggcgcgtt acctcgtcgc cggggccgga gagggcgggc 120
ggaggcacgg ggcctggagg cgccaggcgg aggatgcggg cgacacggtg gcggcggcga 180
ccgcgcgacc gggcgggcgg gcgggcaggg gcgagcggag ggagggagcg gactgcggca 240
ggatctgtcg aggaaaaatc ttgcggccgg cgattccccg ccttttaagc gcagcctgca 300
ctcccccac cccacgcagg ggcgggcctt ccccaacgcg ggcgcccact ggccgccgcg 360
cgccgctccc ctccagctcg cctgcgcctc tcactctccg tcagccgcat tgcccgctcg 420
gcgtccggcc cccgacccgc gctcgtccgc ccgcccgccc gcccgcccgc gccatgaacg 480
ccaaggtcgt ggtcgtgctg gtcctcgtgc tgaccgcgct ctgcctcagc gacgggaagc 540
ccgtcagcct gagctacaga tgcccatgcc gattcttcga aagccatgtt gccagagcca 600
acgtcaagca tctcaaaatt ctcaacactc caaactgtgc ccttcagatt gtagcccggc 660
tgaagaacaa caacagacaa gtgtgcattg acccgaagct aaagtggatt caggagtacc 720
tggagaaagc tttaaacaag taagcacaac agccaaaaag gactttccgc tagacccact 780
cgaggaaaac taaaaccttg tgagagatga aagggcaaag acgtgggggga ggggccctta 840
accatgagga ccaggtgtgt gtgtggggtg ggcacattga tctgggatcg ggcctgaggt 900
ttgccagcat ttagaccctg catttatagc atacggtatg atattgcagc ttatattcat 960
ccatgccctg tacctgtgca cgttggaatt tttattactg gggtttttct aagaaagaaa 1020
ttgtattatc aacagcattt tcaagcagtt agttccttca tgatcatcac aatcatcatc 1080
attctcattc tcatttttta aatcaacgag tacttcaaga tctgaatttg gcttgtttgg 1140
agcatctcct ctgctcccct ggggagtctg ggcacagtca ggtggtggct taacagggag 1200
ctggaaaaag tgtcctttct tcagacactg aggctcccgc agcagcgccc ctcccaagag 1260
gaaggcctct gtggcactca gataccgact ggggctgggc gccgccactg ccttcacctc 1320
ctctttcaac ctcagtgatt ggctctgtgg gctccatgta gaagccacta ttactgggac 1380
tgtgctcaga gacccctctc ccagctattc ctactctctc cccgactccg agagcatgca 1440
ttaatcttgc ttctgcttct catttctgta gcctgatcag cgccgcacca gccgggaaga 1500
gggtgattgc tggggctcgt gccctgcatc cctctcctcc cagggcctgc cccacagctc 1560
gggccctctg tgagatccgt ctttggcctc ctccagaatg gagctggccc tctcctgggg 1620
atgtgtaatg gtccccctgc ttacccgcaa aagacaagtc tttacagaat caaatgcaat 1680
tttaaatctg agagctcgct ttgagtgact gggtttttgtg attgcctctg aagcctatgt 1740
atgccatgga ggcactaaca aactctgagg tttccgaaat cagaagcgaa aaaatcagtg 1800
aataaaccat catcttgcca ctaccccctc ctgaagccac agcagggttt caggttccaa 1860
tcagaactgt tggcaaggtg acatttccat gcataaatgc gatccacaga aggtcctggt 1920
ggtatttgta acttttgca aggcattttt ttatatatat ttttgtgcac atttttttttt 1980
acgtttcttt agaaacaaa tgtatttcaa aatatattta tagtcgaaca attcatatat 2040
ttgaagtgga gccatatgaa tgtcagtagt ttatacttct ctattatctc aaactactgg 2100
caatttgtaa agaaatatat atgatatata aatgtgattg cagcttttca atgttagcca 2160
cagtgtattt tttcacttgt actaaaattg tatcaaatgt gacattatat gcactagcaa 2220
taaaatgcta attgtttcat ggta                                        2244
```

<210> 17
<211> 1744
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. M12625

<400> 17
```
tgaggcctga cttttttcaat aaaacattgt gtagttctgg gcctcctgct gccccggctc 60
tgtttcccct ggcgccaaga gaagaaggcg gaactgaacc caggcccaga gccggctccc 120
tgaggctgtg ccccttttccg gcaatctctg gccacaaccc ccactggcca ggccgtccct 180
cccactggcc ctagggcccc tcccactccc acaccagata aggacagccc agtgccgctt 240
tctctggcag taggcaccag ggctggaatg gggccgcccg gctccccatg gcagtggtg 300
acgctgctgc tggggctgct gctccctcct gccgcccct tctggctcct caatgtgctc 360
ttccccccgc acaccacgcc caaggctgag ctcagtaacc acacacggcc cgtcatcctc 420
gtgcccggct gcctggggaa tcagctagaa gccaagctgg acaaaccaga tgtggtgaac 480
tggatgtgct accgcaagac agaggacttc ttcaccatct ggctggatct caacatgttc 540
```

```
ctacccccttg gggtagactg ctggatcgat aacaccaggg ttgtctacaa ccggagctct 600
gggctcgtgt ccaacgcccc tggtgtccag atccgcgtcc ctggctttgg caagacctac 660
tctgtggagt acctggacag cagcaagctg gcagggtacc tgcacacact ggtgcagaac 720
ctggtcaaca atggctacgt gcgggacgag actgtgcgcg ccgccccta tgactggcgg 780
ctggagcccg gccagcagga ggagtactac cgcaagctcg cagggctggt ggaggagatg 840
cacgctgcct atgggaagcc tgtcttcctc attggccaca gcctcggctg tctacacttg 900
ctctatttcc tgctgcgcca gccccaggcc tggaaggacc gctttattga tggcttcatc 960
tctcttgggg ctccctgggg tggctccatc aagcccatgc tggtcttggc ctcaggtgac 1020
aaccagggca tccccatcat gtccagcatc aagctgaaag aggagcagcg cataaccacc 1080
acctccccct ggatgtttcc ctctcgcatg gcgtggcctg aggaccacgt gttcatttcc 1140
acacccagct tcaactacac aggccgtgac ttccaacgct tctttgcaga cctgcacttt 1200
gaggaaggct ggtacatgtg gctgcagtca cgtgacctcc tggcaggact cccagcacct 1260
ggtgtggaag tatactgtct ttacggcgtg ggcctgccca cgccccgcac ctacatctac 1320
gaccacggct cccctacac ggaccctgtg ggtgtgctct atgaggatgg tgatgacacg 1380
gtggcgaccc gcagcaccga gctctgtggc ctgtggcagg ccgccagcc acagcctgtg 1440
cacctgctgc ccctgcacgg gatacagcat ctcaacatgg tcttcagcaa cctgaccctg 1500
gagcacatca atgccatcct gctgggtgcc taccgccagg tcccccctgc atccccgact 1560
gccagcccag agcccccgcc tcctgaataa agaccttcct ttgctaccgt aagccctgat 1620
ggctatgttt caggttgaag ggaggcacta gagtcccaca ctaggtttca ctcctcacca 1680
gccacaggct cagtgctgtg tgcagtgagg caagatgggc tctgctgagg cctgggactg 1740
agct                                                                  1744
```

<210> 18
<211> 686
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AL042399

<220>
<221> unsure
<222> (1)..(686)
<223> n = a or c or g or t

<400> 18
```
gtgcctgtca tcttcgttgc tgcccacatg atgtcatctg gctgctcttg ggcagggctg 60
ggagccactt tggggttctg ggaagggcag gaggggctct gtggctctaa agcacctccc 120
tttaacccc tttgtccatc cacagctctc ggccacttta accattccca tctggcagtg 180
gttcttgacc cggtttggca agaagacagc tgtatatgtt gggatctcag tgagtggggt 240
tgaagagcag agcctgggtt gagttgggat gtctggtggg aacctcccag ctgattcatc 300
ttcctgcacc cccttcccta gtcagcagtg ccatttctca tcttggtggc cctcatggag 360
agtaacctca tcattacata tgcggtagct gtggcagctg catcagtgt ggcagctgcc 420
ttcttactac cctggtccat gctgcctgat gtcattgacg acttccatct gaagcagccc 480
cacttccatg gaaccgagcc catcttcttc tccttctatg tcttcttcac caagtttgcc 540
tctggagtgt cactgggcat ttctaccctc agtctggact ttgcagggta ccagacccgt 600
ggctgctcgc agccggaacg tgtcaagttt acactgaaca tgctcgtgac catggcttnc 660
cataagttct catcctgctg ggcctc                                          686
```

<210> 19
<211> 364
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. D63160

<400> 19
```
cctgcacagg agattccctg acgttccaca acaaccagtc cttctccacc aaagaccagg 60
acaatgatct taacaccgga aattgtgctg tgatgtttca gggagcttgg tggtacaaaa 120
actgccatgt gtcaaacctg aatggtcgct acctcagggg gactcatggc agctttgcaa 180
```

```
atggcatcaa ctggaagtcg gggaaaggat acaattatag ctacaaggtg tcagagatga 240
aggtgcgacc ,tgcctagccc aggccggcct caggtcagg acgcctccac acatagttgg 300
ttgggggggta gggtttggga gcttggccct acggtttgta aaagaaacac atgtcgtgat 360
tcta                                                              364
```

```
<210> 20
<211> 1564
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. D88587

<400> 20
cgggcaggcc cagccttgta gtctgcaaag accatgcaag ccttggttga taaaccggga 60
ttctactgga agtttgcact ttccccacat cagccaagat gggtaaactg ccttaacaca 120
aaagtcacat gccccacaaa atatttcctt ctatctcaaa acagtattag cttctttaat 180
ctaagaaggt aatgagaggt ttttaaaact gagttaagtc agcagttcag caagtgctta 240
cgaaagacag tcaaaatata ggcaagttac tttaaatggg tattatttgt ccttactttc 300
ccaatgtagg caagtgcctg tgatataaca atttagggaa taatgggaga ataaaaagca 360
tattagtttc aatcagattt cctggcatat atcacagacc ctaaggaatt acaaagacaa 420
aaaagcaagc tctttggttt ctgcatggtt ctttgcagac tacaaggctg cccctgcaag 480
cacttggatg aaaagaccgg gattctactg gaagtttgca ctttccccac atcagccaag 540
atggatctac tgtggatcct gccctccctg tggcttctcc tgcttggggg gcctgcctgc 600
ctgaagaccc aggaacaccc cagctgccca ggacccaggg aactggaagc cagcaaagtt 660
gtcctcctgc ccagttgtcc cggagctcca ggaagtcctg gggagaaggg agccccaggt 720
cctcaagggc cacctggacc accaggcaag atgggcccca agggtgagcc aggagatcca 780
gtgaacctgc tccggtgcca ggaaggcccc agaaactgcc gggagctgtt gagccagggc 840
gccaccttga gcggctggta ccatctgtgc ctacctgagg gcagggccct cccagtcttt 900
tgtgacatgg acaccgaggg gggcggctgg ctggtgtttc agaggcgcca ggatggttct 960
gtggatttct tccgctcttg gtcctcctac agagcaggtt ttgggaacca agagagtgaa 1020
ttctggctgg gaaatgagaa tttgcaccag cttactctcc agggtaactg ggagctgcgg 1080
gtagagctgg aagactttaa tggtaaccgt actttcgccc actatgcgac cttccgcctc 1140
ctcggtgagg tagaccacta ccagctggca ctgggcaagt tctcagaggg cactgcaggg 1200
gattccctga gcctccacag tgggaggccc tttaccacct atgacgctga ccacgattca 1260
agcaacagca actgtgcagt gattgtccac ggtgcctggt ggtatgcatc ctgttaccga 1320
tcaaatctca atggtcgcta tgcagtgtct gatgctgccg cccacaaata tggcattgac 1380
tgggcctcag gccgtggtgt gggccacccc taccgcaggg ttcggatgat gcttcgatag 1440
ggcactctgg cagccagtgc ccttatctct cctgtacagc ttccggatcg tcagccacct 1500
tgcctttgcc aaccacctct gcttgcctgt ccacatttaa aaataaaatc attttagccc 1560
tttc                                                             1564
```

```
<210> 21
<211> 447
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AA224832

<220>
<221> unsure
<222> (1)..(438)
<223> n = a or c or g or t

<400> 21
agcaggccan catactacta ctaanttcgc ggccngtcng actctgtccc gctgcgtgtt 60
ctcctctcag atcggggact cctgcttctc cttgccanta aatggacccc aactgctcct 120
gctcgcctgt tggctcctgt gcctgtgccg gctcctgcaa atgcaaagag tgcaaatgca 180
cctcctgcaa gaagagctgc tgctcctgct gcctgtgng tgctgccaag tgtgcccagg 240
gctgcatctg caaagggacg tcagacaaag tgcagctgct gtgcctgatt gccaggacag 300
```

```
ctgtgctnct cagatgtaaa taagagcaac ctatataaac ctggattttt tttttttttt 360
ttttttgtac aaccctgacc cgtttggcaa atcttttttt ctatgaaata tgtgaatggg 420
caataaattc atctagacta aaaaaaa                                       447
```

```
<210> 22
<211> 567
<212> DNA
<213> Homo sapiens
```

```
<220>
<223> Genbank Accession No. AI052592
```

```
<220>
<221> unsure
<222> (1)..(567)
<223> n = a or c or g or t
```

```
<400> 22
caggtttcta acatttaatc tccacttagg gaattggagg tcagaaatga ataaaatacc 60
atgccccagt aggctccagt ctagggaagt gggcagcagg cagaaaccaa gacacagaaa 120
gcaacgacac ataacagata tgctatgata caaatggtgc tgcaggagct gcacagttcg 180
gaggccattt ctggccagag gatgggatgc gtgaaatcca ggaaggcttc caggaaggag 240
tagctggcac tgggatgggc aggaacagca atgtctctac tgatggggtn tttttntcca 300
aaattttttt tttggagaaa gctggcaaag ttgagaagtt tggagactaa ccgtgacaaa 360
atttaaacat caggtatgtg aaggcaaggg ggaccaactg tgacaaaatg taaacgtcaa 420
gtgtgtgaag tcaaagggga accaggaaag taaaagagtg acaatcagca gtgcttttgg 480
caaaaaggcc tctggcagca gtgtagaaga gaaacgcaga gatcacaggt ataagaatga 540
cagtaggaga ggggaggagg gtacata                                       567
```

```
<210> 23
<211> 430
<212> DNA
<213> Homo sapiens
```

```
<220>
<223> Genbank Accession No. AI937227
```

```
<400> 23
ttttttggaa atcaaaagaa ccagccattt tattccaaga ggggtgtttt ggggcagcag 60
gaataaataa ggaagggagg ggacggggggc agggcaggta ggttctacgt cttgcagcac 120
atcccacact ttgatcgatg acagcagccg cagcagaaaa tgcagatggg gaagtgggtg 180
tctcgcctcc ttcgcctctg gaacatgggc atccagctgg ccctggctcc agctctgtcc 240
tggggttgca gctctgcaag ttgtcccgtc tgttgtggga aaacagagcc actggtcagg 300
ctggcgagga ggaggaggag caggaggcaa gcggcccaga tctgggagct cagtgccatc 360
gtgccgtctg tctggctgtc ccactgctgg gtcttgagct tgctctggtg tctgggaccg 420
agtgacagtc                                                          430
```

```
<210> 24
<211> 630
<212> DNA
<213> Homo sapiens
```

```
<220>
<223> Genbank Accession No. AA167715
```

```
<220>
<221> unsure
<222> (1)..(630)
<223> n = a or c or g or t
```

```
<400> 24
```

```
tttttttttt tttttttttt tttttttttt ttttttttaaa tttcaagaca actttatcca 60
gacaggcgcc tcncaaatag aacacaggga agttaggcag cagttactaa aatacagtcn 120
cgccaaatga tttacaacag aacacaacag gagcagggga tctgtgggtg gggctgggct 180
gggccnctat ctcacagggc ctgagtcaag ccagcccgcc ctgcaaggca gggctgacct 240
gcaagcggag atctcacttc ctcttacccc aaattcatac ctccattttc cccgccccca 300
tctctcccca gggtcctcaa gtgggaaagg gagaggtagc atccctcgga tccaggccca 360
ctccactccg tctccggcac cagtgggcag gctgagtctg ggcctcaagg ggcctgggct 420
tagggtatct atggcagtag gaaaatgaca tggacaggct cttcaggggt aggctaaagt 480
cctctggcca gcagtaccca gagaaaatgg gcagcagcag gtaaaccagc caggaggtgg 540
agtcctctga anccacagca ganccccacct ctggccagcc ctgnccaaat tgggggtaag 600
acatgaaatc tggtaagaaa tggtgcctca                                  630
```

<210> 25
<211> 489
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI424433

<400> 25
```
cctcttcctc ctcctcttct acttcaggct catctttcat tctcattaga gttggaggga 60
gttctggacg cttggggggt aacttcccta ctgttccagt ttttaatttg aatttgcttc 120
ctcctttcat ggcaccaaat agaggcaatg taagcttttt agctttgttt tctgcacctg 180
tagtctgagt ttcagtcttt tttagttctg gaatctctgc tggctttaca attttttatta 240
accctttaag tctctgttgt tctttcctca gttcaaaagt tctcaggtga agtttcttcc 300
gggacacacc atctaatgta ctgcctgatt tcatttctga catgaacgca tctaaagaat 360
cctgagatgg agactctgat agaacttggc ttgaggcttt caatctctca gaaatttcag 420
aaagttccct ctcagcatca tttaattttg caaccaatga ttcaaaggtc tctggcttct 480
catcaatct                                                         489
```

<210> 26
<211> 6711
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. X52851

<400> 26
```
gaattccctt gtaaggtttt cttaacaaaa caccagtcac ataagtgcat tttatttttat 60
attttttgttt atttatttga gacggagtct cttgtctctc aggctggagt gcagtggcgc 120
catctctgct cgctgcaacc tccacctcct gggttccagc gattctcctg cctcagcctc 180
ccgagggggt agctgggact acaggtgcgc accaccatgc ccagctaatt ttgtattttt 240
cgtagagatg gggtttcacc atgttgtcca ggctggtctt gaactcctga cctcaggtga 300
tcctcccgcc tcggcctccc aaagtgctgg aattacaggc gtgatccacc gcacccggcc 360
tatttttttga gagagggtca cactctgtcg tcccggctgg aatgcagtga tgcgatcacc 420
gcccactaca gcctcgacct ccgggctcaa gcaatcctcc ccgcccagcc tcctgagtag 480
cgagcgcctc gacgcccagc taatttttat tttatttat tttttgtag agacggcgtc 540
tctctaagat gcccaggctg gtggccggtg tcgaactcct aagatgaagc gatcctcccc 600
ggccttggcc tccgcgcctc ctaaagcgcc aggtatgagc caccgcgcct ggcctacaag 660
tgcattttaa ttaaagtatt attaatgtct ttgcctgaag aaattcgctt ttaaattgtg 720
acttatcttt cacccaaaaa tcaaagcaca attcagcccc gaggcggggg cggtaggagc 780
tgggcggggc ggggcagggg aaagaccagg agcagagatt caaaaagagt aagagggcaa 840
aatgtgcata atgattcaagc acaggtaaga gcctggccag gctcctgttt taatggcttc 900
ctcctgaaga agattcaagc agagtgtaag atattttcgg aaagtagagc attttgaaag 960
catttcataa tctctcaaaa ccggagactg ctcctgtccc acctcgttag agaaaacagc 1020
gatgctcaaa ggcaacctcc ttcctgacat tgcctggtag gacgcgacgt ggtgtttgcc 1080
cgcgcggaat gcggacgcaa ggctgctcct aggtctcggg gacgcgccat ccccatttcc 1140
gctcgcggag gcgtaggtc cgggcgcggg accccagtcg accttgactg gcggcgcgac 1200
cttgaggcct gcgttcgcct cagttgcccc ctctgtgcaa tggggagacg cgcctcatcg 1260
```

```
cttgacaacg gccgaagagc cgccgcgctt ccgtctcccg cgtgcgcgcg ccatgctgcc 1320
caccccegtt ccgcactgac cctcccccgt gccccgcgtc ccgtactgcc gccccgcccc 1380
gagtcccatg ccgcagccac cgcgacggag cccgcaggcg ggaacctgcc tccgcgcgtt 1440
agcgcgcacg cgcgcctcat gtgtcgtccc catcagcgcc ggcttccgtc tataggccag 1500
atgcactgtc actctggcga agtcgcagac ccgattggcc gggacggagg cgcgagaccg 1560
ggttgcgggc ggggccgaac gtggtataaa acgggcggga ggccaggctc gtgccgtttt 1620
gcagacgcca ccgccgagga aaaccgtgta ctattagcca tggtcaaccc caccgtgttc 1680
ttcgacattg ccgtcgacgg cgagcccttg ggccgcgtct cctttgaggt cgggcgggcg 1740
gcggcgtgcg ggaatggggc ccagaaagtg ggccggggtc ggggtgggtg gtagcgcccc 1800
aaaggcccgg gcgcgggggcg accctgcttg aggggcgagc gcgggcgggc tgcggcgcca 1860
tttcctgacg aggggccatt ttgggaggtc cgcgagtcgc gggaggaggc cgggacgcgg 1920
cggacaaagg caggcggggc ggctgcgagg ccgttggggg aggggccccg cgtccgcccg 1980
cccgcctcat gtggccgcgc cctgtcctgt ccgacgcacg tgctcggcgg ccgcgctcag 2040
gtccgcgcct tgagagtcgt tgtccgccct agcttggcct gggcgccgca gaccggagcc 2100
agaagcacgc tcgcgggggc ttgcgaccgc cttcctggga agctgtcccc tggcaggcat 2160
gggtgcttta catcctgagc tgggaagctg tttgcttgag ggttttttctc aaggatcgag 2220
gcgcggtgtg agcccgtcca tgctcggtcc tgtagatccc gggaggccat gttataaaag 2280
gagacttgct gggatgtgac gggttgccac ttgaaatatc ttccatttgg ataaagtagg 2340
aatatttata catgtgcccc aaacgtccct ccgtgtcccc cacccccaag cggaaatgtg 2400
aaaatgggcc ttgcctttgc tggtgcccaa ggaccgcctt ccactgcagt gacggcgctg 2460
gcggggggagg cgctcttgag ccccctcccga ttgtccctct gcctagcaag caagttgcga 2520
ctggccacaa ggcaggcctc ttccgaccaa ggtggattac cagtgattac ctaattagtt 2580
ttgagagcgt taaatgagtt cttaaagatc agttgtaatt atagcatagt atctaaactt 2640
ggcgcgtgtc ttcaaagtta aatattgagt acgattccgt tccagttaac atggatagac 2700
cttagggagt agcgaaatag gatgttagtg gttttattcc tttaaatcac atctcaaaag 2760
gccaccaatg gctagtttgg atcttattcc gaaaatagat tgatcctcat gcagtcttcg 2820
tgaggacaga gcgatttcct tgttgcctac cctgtccata gtgcctggca cataggcact 2880
gaaacactgc atgttaatcc acaccccacc ccacctatga gtgtagtcaa agctggtaag 2940
tgacaagggc tttcgtggaa acttggcctg acctaatgtt gggcatcagg ttacccaaag 3000
agcttcaggg aaatgagaaa ggacttgcag gtcttgatga gaatggaggg gtaactgcca 3060
atgagggctt tggctttagc gaaagtctga aagggaagcc ataggaactt aaacgtaccg 3120
actataaagc tctgagaaaa gctgatgttt tagaaagacc atacattcta ggtacaaata 3180
cctaaaaact aaaaaataag tacgttggcc aggcgggcgg atcacgaagt caggagattg 3240
agaccatcct gggcccctgg tgaaacccca cctctattaa aaatacaaaa attagctggg 3300
cgtggtggcg cttgcctgta atctcagcta ctctagaggc tgaggcagga gatcgcttga 3360
accccggagg cggaggctgc agtgagccga gatcgtccca ctgcactcca gcctggtgac 3420
agcgagactc ttgtctcaaa aaaaaaaaag tacattgcta taagagaagt gcacacggat 3480
actagtagtt aattcagtca catctgtgaa atagcttata aaatgctact tttaaacaag 3540
ctgtttttat gaaagggctt gtaaatgttt atggtatatact agctacctct ctagccataa 3600
cgtattatac attcaagaaa ggttcaaaac cagatacatt caagaagtga ctgctcatct aatccataaa 3720
taccccacta ctaggtaagg gcctggatac caagaagtga ctgctcatct aatccataaa 3720
gctatgttaa cagattggag gtagtagcat tttcattaca agtgactaaa agaacagctg 3780
tttacccctg atcgtgcagc agtgcttgct gttccttaga attttgcctt gtaagttcta 3840
gctcaagttg gggggtggtg atagacattt aagaagccat atatctttttc agaagtaggt 3900
gtgatgtact aaaagtttga gacactttct agaagtctca ctatttaagt tatgactagt 3960
attggatttt tggcatgtct ttgggtttca tgtttcttaa cccaactgcc tgcagggcct 4020
tatggctgtc aggagcagtt cttgggaatt aaagtaatta ctgaagaagt attctagtga 4080
gaaaatgaat ttatgactca gaagccccta aagacatggg tactaagcaa caaaataagc 4140
agatgttaat taactgtaat tttctcttac agctgtttgc agacaaggtc ccaaagacag 4200
caggttggtc cattttctaa gtttaacaaa gatgttccaa ttgtgacagt ttgtgtgtgt 4260
gtgtgtatat atatattttt atgtatgtat atatgtgttt aatttttttt taaacagaaa 4320
attttcgtgc tctgagcact ggagagaaag gatttggtta taagggttcc tgctttcaca 4380
gaattattcc agggtttatg tgtcaggtac gaaatttact gaatttttatt ttatttgggt 4440
tgctcccttc atttgggatt gagccagaat atttcaggat acacatatct gaactgttac 4500
tctaccattt cggttctatt taaccttct attcagtttg aacttgggtt taaagtttga 4560
accttgcaga tttggcacac ttcatggtta tgttgtcaga agtgacattt ttcctatatg 4620
ttgacagggt ggtgacttca cacgccataa tggcactggt ggcaagtcca tctatgggga 4680
gaaatttgaa gatgagaact tcatcctaaa gcatacgggt cctggcatct tgtccatggc 4740
aaatgctgga cccaacacaa atggttccca gttttttcatc tgcactgcca agactgagtg 4800
gtaagggtac aacatggcac actaaccacc tgactaaatg aaaagttgcc ctgggggggaa 4860
cggaacaaac actactttttc ttcaacctttt gcttccacag acttttttcat ccctaagata 4920
```

15

```
ctagaagaag agcatacata aatgacaaat atagccaatg tgatacagaa tgtcagatac 4980
tatgatagaa acttggccct tagctgggtg gttgaattag gtgctacttt tttgagatgg 5040
agttttgctc tgttgccagg ttggagtgca gtggcacaat ctgggctcac tgcaacctct 5100
gcctcctggg ttcaagcgat tctcctgcct tggcctcctg agtagctgag aatacagatg 5160
tgtgccagca tgcctggcta attttttgta ttttttgtgga gacggggttt catcatgttg 5220
gccaagctgg tcttgaactc gtgacttaag gtgaaccacc tgccttggcc ccccaaagtg 5280
ctgggatttc aggcatgagc cactgcgccc aaccaattaa gtgctttttt tttttttttt 5340
cttttctcag actggatctc gctcttatct cccaggttgg agtgcagtgg tgccatctca 5400
gctcactgca acctcctccc gggttcaagc aattcttctg cctcagcctc tcaagtagct 5460
ggaactacag gcatgcacca ccactcccag ctaaattgtg tattattagt agagcgggat 5520
ttaccatgtt gtccaggctg gtctcgaact cctgggctca agtgatctgc ctgccttgac 5580
ccccccgaag tgctgggatt acaggcatga gccactgtgc ccacccaatt aagtgctgct 5640
tttatgttac tattaataac atgcggttgg ttgggttttt tgtttctttg gggttttttgt 5700
tttgttttgt ttgtttttgg gggagggggg cgcaattcat tctatatgtg taactctttt 5760
ttgagatgga gtttcgctct gtcgcccagg ctggagtgca gtggcgcgat ctcggctcac 5820
tgcaagctcc gcctcccagg ttcacgccat tctcctgcct cagcctcccg agtagctggg 5880
actataggca catgccacca tgcccggcta attttttgta ttttttagtag agacagggtt 5940
tcaccgtgtt agccaggatg gtctcgatct cctgacctcg tgatccgccc gccttggcct 6000
cccaaagtgc tgggattaca ggcgtgagcc accgcacccg gcctatatgt gtaactcttt 6060
aatggtaatt ggagaatcat gtttaatgac atttagtaca aaaggcttca gttaaaaaaa 6120
aaaaaaaaaa gctacctttc tcgtcttggt tcatgacaca tggaggctgc ttgtttgtgg 6180
ttgccagtca taatgattgt tcttcctttt caaggttgga tggcaagcat gtggtgtttg 6240
gcaaagtgaa agaaggcatg aatattgtgg aggccatgga gcgctttggg tccaggaatg 6300
gcaagaccag caagaagatc accattgctg actgtggaca actcgaataa gtttgacttg 6360
tgtttttatct taaccaccag atcattcctt ctgtagctca ggagagcacc cctccacccc 6420
atttgctcgc agtatcctag aatctttgtg ctctcgctgc agttcccttt gggttccatg 6480
ttttccttgt tccctcccat gcctagctgg attgcagagt taagtttatg attatgaaat 6540
aaaaactaaa taacaattgt cctcgtttga gttaagtgtt gatgtaggct ttattttaag 6600
cagtaatggg ttacttctga aacatcactt gtttgcttaa ttctacacag tacttagatt 6660
tttttactt tccagtccca ggaagtgtca atgtttgttg agtggaatat t         6711
```

```
<210> 27
<211> 542
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AF072812

<400> 27
ggttgtgcgc gcaaagccgc gcggggctga gggtcttgtt ctgccggcgc ctgtccggac 60
ccgggcccct ctccgctttc ggccggcctc gggcaccggg cttctggagc tcccggagcc 120
ctgcctgttc cctgtccatc caggccagca gctgaaggag cctcacctgc ctcccttctc 180
tgagtagcac ggatttgagg agaagcagcg aagatgtcca gcgagcctcc ccctccttat 240
cctggggggcc ccacagcccc acttctggaa gagaaaagtg gagccccgcc caccccaggc 300
cgttcctccc cagctgtgat gcagcccect ccaggcatgc cactgccccc tgcggacatt 360
ggcccccccac cctatgagcc gccgggtcac ccaatgcccc agcctggctt catcccacca 420
cacatgagtg cagatggcac ctacatgcct ccgggtttct accctcctcc aggccccac 480
ccacccatgg gctactaccc cccagggccc tacacgccag ggccctaccc tggccctggg 540
gg                                                                542
```

```
<210> 28
<211> 2478
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AF006043

<400> 28
cacctttccg cgggccgcgg ggatggcggc gcagggcgta gggcctgggc cggggtcggc 60
```

```
ggcgccccg gggctggagg cggcccggca gaagctggcg ctgcggcgga agaaggtgct 120
gagcaccgaa ggagatggag ctgtacgagc tggcgcaggc ggcgggcggc gctatcgacc 180
ccgacgtgtt caagatcctg gtggacctgc tgaagctgaa cgtggccccc ctcgccgtct 240
tccagatgct caagtccatg tgtgccgggc agaggctagc gagcgagccc caggaccctg 300
cggccgtgtc tctgcccacg tcgagcgtgc ccgagacccg agggagaaac aaaggcagcg 360
ctgccctcgg gggagcattg gccctggcgg aacgcagcag ccgcgaagga tccagccaga 420
ggatgccacg ccagcccagc gctaccaggc tgcccaaggg gggcgggcct gggaagagcc 480
ctacacgggg cagcacctag gatggggcag agacttgttg catctttgtc cccagcaaag 540
gctacatgtt acctccttca attgataata aacctttctg agatgcaaac tcgagaatac 600
tgcccagtta ctctagcgcg ccaggccgaa ccgcagcttc ttggcttagg tacttctact 660
cacagcggcc gattccgagg ccaactccag caatggcttt tgcaaatctg cggaaagtgc 720
tcatcagtga cagcctggac ccttgctgcc ggaagatctt gcaagaggga gggctgcagg 780
tggtggaaaa gcagaacctt agcaaagagg agctgatagc ggagctgcag gactgtgaag 840
gccttattgt tcgctctgcc accaaggtga ccgctgatgt catcaacgca gctgagaaac 900
tccaggtggt gggcagggct ggcacaggtg tggacaatgt ggatctggag gccgcaacaa 960
ggaagggcat cttggttatg aacacccca atgggaacag cctcagtgcc gcagaactca 1020
cttgtggaat gatcatgtgc ctggccaggc agattcccca ggcgacggct tcgatgaagg 1080
acggcaaatg ggagcggaag aagttcatgg aacagagct gaatgaaag accctgggaa 1140
ttcttggcct gggcaggatt gggagagagg tagctacccg gatgcagtcc tttgggatga 1200
agactatagg gtatgacccc atcatttccc cagaggtctc ggcctccttt ggtgttcagc 1260
agctgcccct ggaggagatc tggcctctct gtgatttcat cactgtgcac actcctctcc 1320
tgccctccac gacaggcttg ctgaatgaca acacctttgc ccagtgcaag aagggggtgc 1380
gtgtggtgaa ctgtgcccgt ggagggatcg tggacgaagg cgccctgctc cgggccctgc 1440
agtctggcca gtgtgccggg gctgcactgg acgtgtttac ggaagagccc cacgggacc 1500
gggccttggt ggaccatgag aatgtcatca gctgtcccca cctgggtgcc agcaccaagg 1560
aggctcagag ccgctgtggg gaggaaattg ctgttcagtt cgtggacatg gtgaaggga 1620
aatctctcac gggggttgtg aatgcccagg cccttaccag tgccttctct ccacacacca 1680
agccttggat tggtctggca gaagctctgg ggacactgat gcgagcctgg ctgggtccc 1740
ccaaagggac catccaggtg ataacacagg gaacatccct gaagaatgct gggaactgcc 1800
taagccccgc agtcattgtc ggcctcctga agaggcttc caagcaggcg gatgtgaact 1860
tggtgaacgc taagctgctg gtgaaagagg ctggcctcaa tgtcaccacc tcccacagcc 1920
ctgctgcacc aggggagcaa ggcttcgggg aatgcctcct ggccgtggcc ctggcaggcg 1980
ccccttacca ggctgtgggc ttggtccaag gcactacacc tgtactgcag gggctcaatg 2040
gagctgtctt caggccagaa gtgcctctcc gcagggacct gcccctgctc ctattccgga 2100
ctcagacctc tgaccctgca atgctgccta ccatgattgg cctcctggca gaggcaggcg 2160
tgcggctgct gtcctaccag acttcactgg tgtcagatgg ggagacctgg cacgtcatgg 2220
gcatctcctc cttgctgccc agcctggaag cgtggaagca gcatgtgact gaagccttcc 2280
agttccactt ctaaccttgg agctcactgg tccctgcctc tggggctttt ctgaagaaac 2340
ccacccactg tgatcaatag ggagagaaaa tccacattct tgggctgaac gcgggcctct 2400
gacactgctt acactgcact ctgaccctgt agtacagcaa taaccgtcta ataaagagcc 2460
tacccccaaa aaaaaaaa                                               2478
```

<210> 29
<211> 1524
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. Y11215

<400> 29
```
gtcgccttcc agcccgtccg cctcccgacc agggcccgcg ccccgtcccg cctctctccc 60
gcccagccaa atgcaggccg ccgccctccc tgaggagatc cgttggctcc tggaagatgc 120
tgaagagttt ctggcagaag gtttgcggaa tgagaacctc agcgctgttg caagggatca 180
cagagaccat attctacggg gctttcagca aatcaaagcc aggtactatt gggattttca 240
gccccaaggg ggagacattg gacaggacag ctctgatgat aatcacagcg ggactcttgg 300
cctgtccctc acatccgatg caccctttt gtcagattat caggatgagg aatggaaga 360
catcgtaaaa ggagctcaag aacttgataa cgtaatcaag caaggatact ggagaagaa 420
aagcaaagat catagtttct ttggatcgga gtggcagaag cgatggtgtg ttgtcagcag 480
aggtctcttc tactactatg ctaatgagaa gagcaagcag cccaaaggga ccttcctcat 540
taagggctac agtgtacgga tggcccccca cctgcgaaga gattccaaga aagaatcctg 600
```

17

```
ctttgaactg acctcccagg ataggcgcac gtatgagttt acagctacta gtccagcaga 660
agccagagac tgggtggatc aaataagttt cttgttaaag gatctgagct ccttaaccat 720
tccatatgaa gaggatgagg aggaagaaga aaaagaagag acatatgatg atattgatgg 780
ttttgactcc ccaagttgtg gttcccagtg cagacccact atcttgcctg ggagtgtggg 840
gataaaagag cctacagagg agaaagaaga agaagatatt tatgaagtct tgccagatga 900
agagcatgat ctagaagagg atgagagtgg cactcgacga aaaggagtag actatgccag 960
ttactaccag ggcctatggg attgccatgg tgaccagcca gatgaactgt ccttccaacg 1020
gggtgacctc atccgtattc tgagcaagga gtataacatg tatggctggt gggtgggaga 1080
actgaacagc ctcgttggga ttgttccaaa ggagtatctc accactgcct ttgaagtgga 1140
agaaagatga aacccaggaa atatattctt ccctctctcc tcctttatga ggaaactgat 1200
catcaaaagt tcccactccc tacttctgca cccaccaacg cctgactcct ctctttgctg 1260
aagagaccca agtctcttga cacctcagag tgactgtaag ctaccagtaa gacaagtggg 1320
aagaggcacg ttcatcaaac ctgttactaa accagcctag tcatagctca tccccatgtg 1380
taaatgtgtc cacacaacca catctgcctt ttccacaagc ttttcacaaa gaaggtgaga 1440
gagaaggaaa ccttgggagg aggacattac tggttgttct ggctggtttg aaaagcacaa 1500
ataaacttgg gatgtggttc cttg                                    1524
```

<210> 30
<211> 19798
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AB014460

<400> 30
```
gatctcaatt cttttcttac tgaaccatcc ttgcgatgta ctcgtcgagg taacagctat 60
tgaatttgac caagttcacc agcaccagaa ggaattccga ggacaagcca acatccatcc 120
actgcaggac aaagtcagct aggggagaag cggcggcagt ttgcgaggac gccgaatcta 180
catctcccac tcacctcccc ctcccccgc aggacagtgt gtccaaaccc gtcactgcca 240
gaaaccccat catcagtccc ccggcagcaa cagacagacc acgcactggg cccgaagagg 300
ctcaggggag cccagggcag gccggctacg cacggacact aggatctacc gccctgggg 360
ctgcacagag ggtctgtgcc gaggcggcag cagaagtgtg tatgccgtac actcagggcc 420
caacccgagg ctgggagacg ccgacatcac cagactcctg ggcgttcccc accccagca 480
gagagcggct cggaggagac gtgtgcacac ttggctgccg gccacgtcac ctcagacagg 540
aaacctgacg gtaggcacct ggccggcacc tgtcctgcag cagcccagc cactgaggcc 600
cttttctggg cgacagaaca gcaaagccag agtcagaccg atctcttcct cctctttctc 660
tacttcccag aatcatgaca cagagaccca agactaatgg aaacctccca ccacaggatg 720
gcaggaggaa ggtccacaaa gtggagaaag gaggaggaag acgggaccag tacgctccgg 780
ttgagaccaa gtcagcagca ccacctccca gtgacagaac tcgcccagct cctgccgttg 840
cagaggtgtt cggaggcccc aagccccaga gactcacagt cagcaggtct ggggtgaagg 900
ccaggactct gcatttttaa cacgtgcctc aggggcactc cggccacgca ggtgagccca 960
ggtgcatgaa gcagggtggg cataccgct gcaggccatc cctgagaacg gcagccctc 1020
cccagcccca ggtccttcc atccaggtta cacttgatcg tcaaggccag agaaacctcc 1080
aacccaaggt ggcacccacc cagctcttcc tccaagtagg tgatgtgtct cccattgtct 1140
gtgagggcct tgaaaacctc cagcctttcg tgaaggtctt cgttggaagg gtaatccttg 1200
atgaccttaa agaagagggc tctgaggacc cccaaacgct cgccctaaag acaaaagcca 1260
caggatcagc agagcctgcc agcgtcgccc acacggctgc caagaagtcc ctgaagtgca 1320
ggggcacccg gactccagcc ctggacccct ctccttccca cagaggcgcc ctgcaagaga 1380
caggtctgca gcatcagcat tgtacagggc aggggccgg atgcaccggc cgaccgcaga 1440
gcggcgtatg gggagcaact ggtgtgtgtc gggacctggc acagcgggtg cgcgcagagca 1500
ggggatgaca cagttcatgc ccgaccctg caatcggtgc agggcagaca gcgttgtgat 1560
cagagagtga ggacaaggcc tgagtggggg aaacccagga gagcctgtga gagtggacgg 1620
cccttctgag cagctgggac atgaaggagt agaagtggcc gaccagggga ggcaggaaca 1680
ccaagaggcc tgggtgttca gggtcagcca agaccagcac agatggaatg cagtgagcag 1740
gggagtggcc ccgaaagggt gcaagggcaa aacaacaccg tagccccaca ccagctgcca 1800
ggtacgatct cagcactctg cgacaactgc ctcatatgat ccccagaaca tcccataaga 1860
ggaaggtgca gtgaccatct gtttacaggc gaggaggcag tgcctacggt cacacagacc 1920
tcatgacacc aggagacccc acaggccatc cagctccaga gcccatcagc ccctagaccc 1980
tgtgcccagc aactcaccga ggcaggagtc caaacacggc ccagcaggga caggacagtc 2040
agtgggcagc ctgacgtcac ccatcccagc gtcgccctgg gccttacctg cccctgcacg 2100
```

18

```
atggccttca gcagagccag caccgcgtgc cgggcctcca gcggccgctc cggctgcaac 2160
agatccgcga ccgccttcca gagtgcttcc actgcgtgct gtcaccagca gaggggacag 2220
cggtgaggat gtgctctcca agaaccctgg ccccggcaac tggagcagtg ccgtgagcgg 2280
aggacaggga ggaacaacgg gggcttgtga ctgagagccc cacctccaaa gctcgtatct 2340
cctgtgtctc ctgcagcctg agatgaccac aggcttcgta cagggaacgg ctcagagctt 2400
cctcaaaccc cagcaggtcc ctttaactcc caccaggtga cagactgggg gctgagagga 2460
cagcagcaag ccagggcagc aatggtggcc tcacctggac caggagggag tcccactaga 2520
gctgccggaa tgctggcagg aagtcatggg acagtctcag aaccacaagt gcacactaag 2580
ccctaggcct gcacctgacc cagaatccct gcttgtggct ctcctctagt gaacacacca 2640
gcatcgggcc ctcgacccca tgcccctgcc cgacctctgc tgcctgcctg acctgctgag 2700
aaagagcgct gcgtggcctt ctgaaatctg cctcctctaa ctaccaccca gcctgtgagg 2760
ggctcatccc tgctccctaa agctgccaga atcagtctca ctcggcaggg gtttgggctg 2820
gctctcacca ccttcccttc tccacattaa ccaacagcca cggctttcag accacaggct 2880
cattcctggc cttactcctc taaggagggg aactaaaatg gccgtgttcc ggccaagtgc 2940
ggtggctcac acctgtaatc tcagcacttc gggtggcaga ggggagaggg tcacgtcagc 3000
ccaggagttt cagactagcc tgggcaacac agtgagaccc tgtcacgaca aaaaatacaa 3060
aacttagcca ggcgtggtgc tgcatgcctg tagtcccagc tacttgagag gctaaagtag 3120
gaggatcacg tgagcctggc aggttgaggc tgtagtgagc catgattgtg acactgcacc 3180
ccggcctggg tgacagagtg agaccttgtc tctaaccaaa taataacaaa atggccgtgt 3240
tcttttagat gtcatctgac caacatccca accactggca ctctcacctc ctttgtctca 3300
ttgacaatac tctttttttt tttttttttt tttttttttt ttgagacgga gtctcgctct 3360
gtcgcccagg ccggactgcg gactgcagtg gcgcaatctc ggctcactgc aagctccgct 3420
tcccgggttc acgccattct cctgcctcag cctccccagt agctgggact acaggcgccc 3480
gccaccgcgc ccggctaatt ttttgtattt ttagtagaga cggggtttca ccttgttagc 3540
caggatggtc tcgatctcct gacctcatga tccacccgcc tcggcctccc aaagtgctgg 3600
gattacaggc gtgagccacc gcgcccggcc tcattgaca atactcttac cgttgcaacc 3660
tgagctgcaa agatccgtgg acacagggcc cgggaccatc ccagcctcgg aggcctattt 3720
atccactcac aggctgcccc gtacccacac aaacaacttt cagaacagga tgcaggacgc 3780
ttgttctttt ttttgttttc tgagacagtc ttgctctgtt gcccaggctg cagtgcaatg 3840
gcacaatctc agctcaccac aacctctgcc tcctgagttt aagcgattct cctccctcag 3900
cctcccaagt agctgggatt acaggtgccc gacaccatgc ccagctaatt tttgtatctt 3960
tagtagaaac agggttttgc cacattggcc aggcgggtct cgaactcctc acctcaggtg 4020
atccatccac cttggcctcc caaagtgctg ggattacagg cgtgaaccac tgcgcccggc 4080
taaggacacc tgttctttac acctatcttt ggtagtgtac ggccagcacg tttcagatga 4140
gctgctgcag aggtagcaat cactctcctc ttagcagatc tgagcatgag aggtccaggt 4200
ctcactgctc tcccacacac aaatgctggg caaggcaagg gcagagccct caggtgctct 4260
accagcaacc tgcactccca aaatgaccac ttcctgtcct gtccacaagt catcagggaa 4320
agtctggcaa tgtttgccca aaataaatat ttctatgtcc gtgaggtcgc ccaataccac 4380
cgaccagtca ccctcccaaa atggcaccaa gaccagcgtg cctaggattg ttctctgtgg 4440
aacaaaccct ttcttgattt ttcttggcct gaacttgtaa caggagagag cgagtgagca 4500
tgcgtttcta tcagccacta caaactcttc cttttttttt tttttgagac agagtcttgc 4560
tccgtcaccc agactggagt gcagtggggc gatctcggct cactgcaacc tgtgcctccc 4620
gggttcaagc gattctcctg cctcagcctc ccaagtagct gggattacag gcatgtgcca 4680
ccatgcccgg ctcatcatct tttagtacag acggggtttc gccatgttgg ccagagtggt 4740
cttgaactcc tgacctcgtg atccacccac ctcggcctcc caaagtccta ggattacagg 4800
cataagcccc cgcaccccg ctcggcatag aaatcctttc tggtgttgct agaaaagcct 4860
aatccctttg ctccccattt ccacgcttga ttggtccctc aaggttgtat tcgggggcatt 4920
tccagtagct tccccatcac tacgatgaaa gctaaattcc cctaaaacag tgcaaactgg 4980
ctgggcgcag tggctcacgc ctgtaatccc agcactttgg gaggctgagg catatggttc 5040
acgaggtcag gagttcaaga ccagcctggc caacatggcg aaaccccgtc tctactaaaa 5100
atacaaaaag ccgggtgtgg tggcgcgtgc ctgtaatccc agctactcag gaggctgagg 5160
caggagaact gcttgaaccc aggaggcaga ggctgcagtg agccaagatt gtgccagcct 5220
gggcgacaga gcaagactcc atctcaaaaa aaaaaaaaaa aaaaagtgca aaccagatca 5280
tcggcagtca gctgtcaacc atgttcctaa aaaaagcaaa ctcaggctct gaatagtcta 5340
cgtgcctctc tctagtagct caactggata aacctacctc ttcaaatttc ttggttttg 5400
cgacttcaca aatctgccct atcatccgga tgcgattgtt gaggccacat tccatgctca 5460
gttcctggag agagatgaaa gaagaaaaag gggctgcatttt ccagactaga gacttaaaac 5520
ctgcaagtca caaaccacct aaagactccc actgcatttt ccagactaga gacttaaaac 5580
agatctttct ggaatcaaga ttcacttgac gagccgcggt ggctcaggcc tgtaatccct 5640
gcactttggg gggccaaggc aggtggatca ccagaggtca ggagtttgag accagcctgc 5700
ccaacatgat gaaaccctgt ctctactaaa aatacaaaaa atttgctggg cgtggtggtg 5760
```

```
ggcgtctata atcccagcta ctcgggagag tgaggcagga gaatcccttg aacccaggag 5820
gcggagattg cagtgagccg agatcgcgcc cctgcgctcc agcctgggtg acaagagcga 5880
aactcggtct caaaaaaaaa aaaaaaaaaa gatttactga ggggctttac tgctccatcc 5940
cgaggagttg agaatgtgca attttttttc acaactgcaa atgttgtatt gagataaaac 6000
ataacatgaa atacaatttc aaactgcaca attttttttt agacggagtt ttgctcttct 6060
tccccaggat ggagtgcagt ggcgcgatca cggctcactg aaacctccgc ctcccgggtt 6120
caagcaattc tcgtctcagc cccccgagta gctggaatta caggcgccca ccactatgac 6180
cggctaattt ttggtatttt tagtagagac ggggtttcgc catgttggcc aggctggtct 6240
caaactcctg acctcaggtg atccacccgc ctcggcctcc caaagtgctg ggatgacagg 6300
cgtgagccac cgcacccagc caggatggac tatattttat tcatcagttg atgaacgttt 6360
tagttgtttc taagtagaaa actttacaag tgcaaaaatt cagcatttac tcatgggcaa 6420
aacacaatgc caggcatgtg tgacaaagac acaaacacac ataaaagata acgacctagc 6480
ccatgtgcga tggctcatgc ctgtaatccc agcactttgg gaggccaaag cgggcagatc 6540
acctgaggtc agcagttcaa gaccagcctg gccaagatag tgaaactcca tctctactaa 6600
aaatacaaaa attaaatggg tgtggtggca cgtgtctgta gtcccagcta ctcaggaggc 6660
tgaggcagga gaaccacttg aaactgggag gcagaggtag cagcgagcag agattgtgcc 6720
actgcactcc agcctaggca acagagcaag actcagtctc aaaaaaaaaa taaaataaag 6780
aacctacttc tcccaggaac tcacatctta tcatgtaaca cctggacata tccttacctg 6840
tgaagatgat gatactcagg cctcatctat aagatgggct ttctttcatc aacatctgaa 6900
tagtaactca agtgtgcctg aaccaggtca ccaagatcct gactttcgaa gtctcctgag 6960
gaaggacatg tcggcctcca agtactggag acagcattcc tgtgtagaca gttgccagca 7020
acccgtctcc cacagaacct ggtgcaagac caaacccagc cttctctgca tttccctcta 7080
gcctagcaaa gacacaggta gctcactcac tctcagtatt ccgcggtga tgataaactc 7140
cgtctgttta ccctctgcag acctgggatt tggcctcggt gttcccagtc ccaacagaat 7200
cttaaacttc tccttcaagc ctgaatcttt gcttgttggt ttggccatgg tggaccagga 7260
cgcaccagaa aacccctctg tgcaaacgaa acaggaatgg ggacatctga gcaacacctc 7320
tgcccacctt ccccactgcg gacctccagc cgtcaggacc ctgggtctct ggtgggcata 7380
acctttcctc ccacactccc tgggagaact caactacagc ccagctgacc agctcgcaaa 7440
caggcaccta ggaaagcccg ggagacacca ggcctggtct agagagctct ctactcagac 7500
gctgccgccc gccccgcccg actcagtgca cgggttagga ctgccgccgc gaagtcctgg 7560
gagccccgac gtttgccgtc tctcctctac ccatgtgaag caggagctgt cacggagccg 7620
cctgcagcag agacccgttc gcacccgcca tgacttaaaa ctaagggatg ctcggagctc 7680
cggagtcggg ttgcagtggg cgcgggtgag ggcccgggac ccggacactg cggggtccgc 7740
ctctctaggc cgctgccccg tggggaccgc cacttgcccc gtggggaccg ccacttaccc 7800
cgcgccgcgc caccgcgctc cgggccgccc cgacgcggag aaaggcgcac cccctggcc 7860
ccgggacgcc gccggaagcg cgacccgcac ttccggtagc ggcattgcgc ggagggccgc 7920
cttgggagct tgctgggagt tgtagttctg tgccgccctc tggcggaaag gccggcgatc 7980
cttgcatcac gtgacggggc cgcatgggcc gccgggatgt gtagtccgca ggagtccggc 8040
atgaccgcct tgagcgcgag gatgctgacc cggagccgga gcctgggacc cggggctggg 8100
ccgcggggt gtagggagga gcccgggcct ctccggagaa gagaggctgc agcaggtagc 8160
gccgcgccgt ggctggagcg tgggaggagg cgggataggg gctgcaggct ggagtcccgg 8220
gccgcctcct gcggctccca gctgcgcggg cagggctgc aaacccggca gccgcgaacg 8280
gttcccacgt gcggccctgc gttcccacct tgcgcctttt tcccaaagat tgcggtccgc 8340
aggggctggg tttcgggcgc tccgctccgc tgcccccttt cgccccaagc aagaaaacgc 8400
ttcctttccc accactctgt ccgggactct ccactccagg ctctgtgggt cccatccccg 8460
ccctcctgca gtgaacttgc tgtcctcgga gaggctgggt gccaaggaca cacgcagcca 8520
gaagcctgct cccccagctc ggggggaggt gcctctgagg gaaaacagga aagggcatgg 8580
cacttattat atttatcctg cagccgttga ggacctgctg gggaccaagc actgcagtga 8640
gcagtgaggg acacggacag ggcctctgcg ctagtcccgc tgggacttct gcagaattgg 8700
ccaaagttgg attcccatag gcacccaggg accccaggga tagtccaaac tatggcagga 8760
ggaactggtg cagctgggag caggcaggtg gtgatgccag ccagggtggc aggagctttg 8820
atgccaggat agagtttgga gtttattatg acagtaaacg gaagtcaatt aggaggtttt 8880
gttgtttgtt ttgagatcgg gtcttgctct gtcacccagg ctgtagtgga gtgttgtgat 8940
ctcagctcac tgcaacctcc gcccccagg ttcaagcagt tctcctgcct cagcctccca 9000
agtagctgag actataggcc cctgccacca cacccggcta acttttgtat ttttagtaga 9060
gatggggttt tgccatattg gccaggctgg tcttgaactc ctgacctcaa gtgatccacc 9120
cacctcggcc tcccaaagtg ctgggattac aggcttgatc caccgcgccc ggccggccag 9180
gattttttaa aagggagtga cacaacctga tgtgggtgtt agcagactgt ctctggtgca 9240
gtatagaaga tgtattgggg gcaccttggt acaggctgtt gctagagtcc tcatgagcta 9300
acatggacct tgtcagggtc gctggcataa ggagggccca cataccccag actgcagagg 9360
gcagagcacc ccaagtgtat tagatgatgg acagttgtgg catgaacgag tgaggggtga 9420
```

20

```
gctagcaggc gggatggcac ccctacccta ccttcacctg tggccccacc agagggactg 9480
cgtggtgctt tttgcagaag cgaggaaaag ccacagcccc gtgaagcgtc cgcggaaagc 9540
acagagactg cgtgtggcct atgagggctc ggacagtgag aaaggtgagg gggctgagcc 9600
cctcaaggtg ccagtctggg agccccagga ctggcagcaa cagctggtca acatccgtgc 9660
catgaggaac aaaaaggatg cacctgtgga ccatctgggg actgagcact gctatgactc 9720
cagtgccccc ccaaaggtag gcaggggccc catctgccca aatgacccc .catcttagca 9780
aggtccttgt tttctttcta cccggtggct tttggctggc accctcccct gcagacagca 9840
ccttgggagg atggacaccc ggtgccccag agcatcgcct gcatcactgt agccactcag 9900
caggtcagga caccagtggt ttagggcctc gtgctcgaac ttctgcccag tgcaggcgtg 9960
acctgggctt tgtgtgatat caggaaggaa gagttccttt tgcttcacgg tcccagggcc 10020
tgaaaccctt agaccaagct gagttctaat ccctattctg ctaccaggtg gcttggatac 10080
aggcctctct gagcctcagt ttgcttgtct gtaaaatggg tagtatgggc caggcatggt 10140
ggttcaggcc tgtaatccca gcacttcggg aggccaaggc gggtggatca cctgaggtca 10200
ggagttcgag accagcctgg ccaatgtggc gaaaccacgt ctctactaaa aatacaaaaa 10260
ttagccaggt gtggtggcag gcacctgtaa ccccagctac ttaggagggc gaggcaggaa 10320
aatcgcttga accccggagg cggaggttgc agtgagccaa gatggcacca ccacacttca 10380
gcctgggtga agagtgata ctgcatctca aaaaaaaaa tttgttttaa acgggtagtg 10440
tgatgattca cgaagcaatc ataatagtag tggccaatgg ctgttcagta gtgatgggcc 10500
agatacgatc gtgttgggtt ttttttttgag accaagtctt gctcttgttg cccaggctgg 10560
agtgcagtgg tgaaatctta gctcactgca accttcgcct ccgaggttca aattattctc 10620
ctgcctcggc ctcccgagta gctgggatta caggcatgca ccaccgcacc cagctaatgt 10680
ttgtattttt agtagagacg gggtttcacc acgttgatca ggctggtctc aaactcctga 10740
cttcaggtga tccgcctgcc ttggcctccc gaagtgctgg gatgacgggt gcgagccacc 10800
gcgcccggcc acatacgatt ctaagcactg agataattca tttaagcttc acattactcc 10860
agtgagtcag gtactattat tgtcctggtg ttgtagatga ccaaacatac ccaaaccaga 10920
cctccccacc ccacagggggg aggctgatgc ctcaagtgtg gcccagggca acaaaccagg 10980
gtgtgtcgag ggcgggggggc ggagcctggc cagggaatca cccaggaccc gccgccaccc 11040
cggtccctgt cactgcacaa gcaggtacgc aggtaccagg tgctgctgtc actgatgctc 11100
tccagccaaa ccaaagacca ggtgacggcg ggcgccatgc agcgactgcg ggcgcggggc 11160
ctgacggtgg acagcatcct gcagacagat gatgccacgc tgggcaagct catctactccc 11220
gtcggtttct ggagggtgag ccctgcctgt ggcaacgggg ccgggtggc agtggcctga 11280
gagagacctc agaaggctga ggggggtggc gacggtgcag gaagtgaggg tcaagcatct 11340
caggctcggg gggtccccct gaagcccccc ccaggccgtg gggccctgag gcctgacgcc 11400
cagtcccagc agctccttgg ccttcctgtt cgcatcctcc cttccttcct ctgcttccct 11460
gcctcgccgc ctgcccaccc ttcctcaccg ccaaggctgc ctgcccaccc gcctttccct 11520
ttgtttactg ctagcctctc ccggtgtgtc acccctcct gtccagagcc cctcaccctc 11580
caggagccct ggggaggctg ctccccaacc ccgccagca ctggatggtg gtgggcggat 11640
ctgttgaaag cagcttggtg ggtggggccg cttcccttg gcaccgcgt gggccgcagt 11700
ttctcagatg ggtttttaaat agccctctcc actcaggcac aggatgggaa ccacccggca 11760
ggcctggcag ctggtgggga agccccagct ccagccctcc ttcctgaagg cgcaggtgca 11820
gccaagcccc actcctggga gcggctggcc tgcttggcct ggctggggtg ctggcaggga 11880
atgacgggca ggggaacccc agccagagcc tacacgtgca tcattggccc acacgggtgg 11940
gaggagggggg tcaggcctac cttgggcctc cctgctgccc tccgcttgtt cccgcctcct 12000
ggggggcggg ggctgagctt gcacacgtcc tcagcaggtg caggtagctc tggccacctg 12060
tgggtctcct gggggctgca tcctcccagg ttgggctgtg cccttgcctc caaggctgaa 12120
cccaccctg tctttcagag caaggtgaaa tacatcaagc agaccagcgc catcctgcag 12180
cagcactacg gtggggacat cccagcctct gtggccgagc tggtggcgct gccgggtgtt 12240
gggcccaaga tggcacacct ggctgatggct gtggcctggg gcactgtgtc aggcattggt 12300
gagtagagga gggcggggct ggctccagcc cactggctgc tcttgggatt ccccacatcc 12360
ttgtgacctg tgactccact tccagcatgc tggtcctcca cccagcccat agagtcagaa 12420
aggtgctccc agggtggagc caggccagcc ccactcagag acaggtgctg gggcaggagg 12480
tcacatgggc tgagcacctg ctccgtgcag ggctctgaga gaggcccgg agctggactc 12540
catctgcgtt gtattcggga gaaatgtgga gcgaggaatt ccccactcgt ggagtggaaa 12600
ccctgatggt tgtgcagggt gctcttgggg cctggcttgg gcccagggcc tctgggaagg 12660
cccccaaggt catccttcac ctgagagctg cagagcaagg tggggtgagc caggccaaga 12720
ggaggaagtg tgttcccagc agaaggaaca gcatctgtaa aaccatgatg cgagagagag 12780
ggccaggagc aggaagttct ggaatgagat gagggcagag tggggaggta aggactgagg 12840
agggaggagg aagagtatcc cctcagcagg tggggtgggg agggaggtgc tggggggata 12900
aagggggagg gtggggaggg agggtgggga gggaggcgct gggaggatgg ggggagggtg 12960
cgctggggga atgggggaag agggtgggga gggaggcgct gggaggatgg ggggagggtg 13020
gagagggagg tgctgcgggg agaagagggg agggttgaga gggagaagag gggagggtgg 13080
```

21

```
ggatggaggc actggggggga gggccctcct tgaatccttt tcccaggtcc tggtgtctct 13140
tcctagcacc ggaggcttct tggcagttgg gtgcagacag acccctgggt ttggggtggg 13200
gctgcctcct cctcggcttt gtccagagga tttggggctc ctaaggccac acgcagccgg 13260
gcccagccag tccagaaacc agggcttggc cctgccctct gtgtgccccc atcccaggcc 13320
cctttgggac tcctgcaggg ggcctgtgcc ggaggcgggg ggcttgcagc actttctggt 13380
gggcaagagg gccaccaagg gccggggggcc tctattctga gccggggcca cctggtgagg 13440
ctgaacagcc acagcagccc caaagagcca gagccaggcc aggtgcgccg gggcagggcc 13500
tcctcccgac tgagactccc agcgtcacca cctgccagcc tctcagtgga cacttgagct 13560
tatctgggcg gctgtcctca gctgcccgtg tccctggggt gctgcatcgt ggttgggcag 13620
ggctgtgggg gaaggtccct gcccgcagcc aggcagggaa cgggctttgg gagcagcggg 13680
cacaagagac agccatgtgg aaataccctcc ctctccaggt gtctgtgggc ctgaccacct 13740
gcaaggagac cccagggctg cctcctaggg gttccccgaa agagaaacgc tctcagttaa 13800
aatgtcagag ctggctgggt acaagggctc aagcctgtaa tcccagcact ttggaaggcc 13860
gaggtatgtg gatcacctga ggtcaggagt tcaagatcag cctggccaac gtggtgaaac 13920
ccgctctcta ctaaaaatac aaaaattagc cgggtgtggc caggcgtggt ggctcacgcc 13980
tgtaatccca gcactttggg aggccgaggc aggcagatca cgaggtcagg agatcaagac 14040
catccaggct aagatggtga aaccccgtct ctactaaaaa acacaaaaaa ttagccaggc 14100
attgtgtcag cgcctgttgc tcccagctac tcgggaggct gaggcaggag aatagtgtga 14160
acctgggagg tggggcttgc agtgagctga gatcgcgcca gtgtactcca gcctgggcga 14220
caaagcgtga ctccgtctca ccaaaaaaaa aaaaattagc cgggcgtggt ggcaggagcc 14280
tgtaattcca gctcctcggg aggctgaggc aggagaatcg cttgaaaccc agaggcgaaa 14340
gttgcactga gtggagatcg caccattgtc tgtatccagc ctgggtgaca gagcaagact 14400
ccgtttaaaa aaaaaaaaaa atgccacagc cataaattgc tggctccggt cccagctctg 14460
cacctcctgg ctgggtgact ctgggccagg cccttggctt ctctaagctc tggccacaaa 14520
gtgggtgagg cagtcctcgt cattcactgt ccaggtgggc aggaggctca cacaacgtga 14580
cgtggcctga ctcagccttg aagcatggcc acttccgtgt tacagaggag gaaactgagg 14640
ctcagagccc caggggtgtg acccctcagg ccttgtggtc tccccacacc ctcggacacc 14700
tttttctagg cagcagcgaa ggagctggtg caggcctcgg ctttctcttt gggaaacacg 14760
ggaggaggag gcagggctgg ggctgcagct ggccggggcc accgggtggg agaagggagc 14820
cccagtgagc agacgcctgg ggtggccagc tgaggggagc aggagccaga acccaggtgg 14880
acagcagctg cggccggcca gggcatgctc ccgctgtgtc cctgaccgct gcagtggcag 14940
gtgctaggtc tgcaggcagt gacctcatgc cggcctgcca ggcagagctg ttgccaccca 15000
gcctggtgcc cagagccagt gcttatgccg agaggagcct caggccacag gagacagaca 15060
gagggaagcc tggatggacc cttccgggga cagggccacg tttctgggga ggctgagggc 15120
tgagaggtgc ttcggagtcg ggatcctgcc gggcctcggt ttcagcatcc gtaggacctc 15180
atgaggactc actgagctgg ccaatctctc tggcagggtc tggcccccag caagcgtttg 15240
tccaagcgag ctgtcgctgt tattgtgggg aatagagctc caagcagagc cgagtcatca 15300
cccccaggcc ctgcccaaag cagagacccc accacccaca catccaacta gcaccagtgt 15360
tgggagtggg cagcccagaa cagagccccc caggctggct caggtgatgg gagagaggcc 15420
tgcaccccaa cagagggctc agcccctgcc ccagcacctc aggggcagcc aagatggtca 15480
catgtaggct tgcagccagg gctttgcggt tccaatgtct aactggtgga gtgtgcccct 15540
ggtggcagac tcgcctctgg gcggggaggg gcacgggcta ggctggtgga gtgtgccct 15600
gttcaccccg cttggcctcc cagcagcagt ggacacgcat gtgcacagaa tcgccaacag 15660
gctgaggtgg accaagaagg caaccaagtc cccagaggag acccgcgccg ccctggagga 15720
gtggctgcct aggtatgagt atgtgggggg cttcctaggg agaagagctc accccgcccg 15780
ccctctgtca gcactgaccc agcccccacc cccacaggga gctgtggcac gagatcaatg 15840
gactcttggt gggcttcggc cagcagacct gtctgcctgt gcaccctcgc tgccacgcct 15900
gcctcaacca agccctctgc ccggccgccc agggtctctg atggccgcat ggctctggcc 15960
gaggtgccgc tgtggccacc gtctgtgaag tggctttacg cttcaggaag ccacgcctgt 16020
tgaataaagc tttggtgtgt ttgcagatgg gatctggctg atgtctgtcc ctgaggggggc 16080
agagagcctg ggaatcgcat acaaggatgt gttcgtacac acccgtgctc gcgtgtctgg 16140
agcaggggctg cctgggaggc cggctgggga cgtgacaatc tttgctatgt actcagggag 16200
gggggagggggg tgtgcatgaa cctgggaggg aggaagtggg gagagccagc tgcagccagc 16260
tgttggaagt ccgctgggga agcaagcagc ccccgggcag ctggctgggg accctggccc 16320
ctcatgctat ccaccgccgg cccccccagct tcccagcccg acaccgcca gctcctgaac 16380
tttcatgccc tcaaagccca gcctctgcca gggtcccacc cctgtttaca gagctacccg 16440
gccttgaaag ggacactggg gacccaggca gggcgccaca gggtacaaag cttgacctgt 16500
gactgctaga ggtcgcaggg tgaattgggc aaagggtggc ccgtgtgggt gttgtgtggg 16560
gccggatggc ttcacaggga aggtgaaggt gggaggctga gtctgccaaa taagagagat 16620
gggcatgggc ccaggatgtg ccacacagca ggggtccca tgggggtcag cgggggagat 16680
ggagcagggc tgggagcaga tggatgcagg gcacgggctc aggaacgaga ccgtttccag 16740
```

```
ctgctgagac tcggggaggg ggctccctga aacagcctca tccctccacc cctctcaccc 16800
cacggggagg aggctcagaa aagacagagg cgtgtgggtc ccaggcaggg cctgtttatc 16860
ctgagagcgc gcatgcgcta tggcttacga ggcaacagcg gtgccggtcg atcggtggtc 16920
ggttcggggg tgcggggccc gggagggaag tgcaaagtca acagggtgtc cacggggag 16980
cccgccaagc agggctgagc caaaggccag gcgtccttcc cgggtgccgc tctcacacac 17040
ctacgttccc caggcctggg agctgccgcg cggaatgagg ggcctgtcca aaggccgccc 17100
tcctcgggga cttggggcct ccatcctcag gccctcgga aagcccaggc ccccagcagg 17160
gcacaggcgc acagggtacc tgggtggga gcagggtgtg gcctagggac ccccacacca 17220
gggcaggtgg gcaggggcag ctcctacggc cacatcaggc ctccctggcc ttacccaagg 17280
tccccacaaa aaggctgggc gccccaactt ggccactggg aagtcccagg gactcccact 17340
caggacggcc gctgctgagg ggaggggggcg gggaggaaat ggtttgcaga gaaaggtttg 17400
ttttattgca attatttaga gcgcgtccca aggggagg gaaggggg gggaaggggg 17460
gggggtctct ggtattaagt ggaaacatgt gtggagctgg agatctttt ggaaaaaaag 17520
caaaaacaca aattcctttc agtcagcagg ccccggcaga gcagcaaagg ccctcgcccc 17580
gcggctgccg cgcgctcgct cgctctctct ctgtctctct ctgtgtctct ctctctctct 17640
ctctgtctct gtctctgact ctctctcaca tctctgggtc tctctccccc tatcttgctg 17700
ccacaggccc ccagtacctg gtgggcaggg gcaggatggg ggctcaccgg ggctggggct 17760
gatttctggg caatggcagg accaccctcc agtccactga ggctggggga gctcggggca 17820
ggctgaggcc caaggtccgt gcgggagggg tcccagggtc ccgagacagg caggaagggg 17880
ctcagaagtt gctgaagatt tcacgcttcc tgttccagtc catctgtggc gcgcgcttgt 17940
tgactcgcat ggctcgagcc ttctccttgg cctcggccgc cgtggggctc aggtggaggc 18000
cgctctcctg gaagggatct tgcttccagg cactgccatc ctggggtgag cacggtgggt 18060
ggggtgtctg gagtgagccc tagtcccaca ccccagacgg tggcccctcc tagggagcaa 18120
ccaacagagg ctgcctgctg gggctggggc tcacgaggac ttcctgaaca gagaccccac 18180
tgcccgggct gacatctcca cagacgccta ccccaaggcc tctagcaacc ccacgtgtga 18240
gctcaggagt ggagaacatc catacctcag tgtccttgtc ggaaccaggc aggtcacttc 18300
gggacgagca cgcagagcca ccattgagct gggaaaccaa gggcagattg tggtttcaca 18360
gacacacaca acacctgcac acgcacacat gtgcacagag gcacaccccc cccagtgtg 18420
tgctcctcca ctcggcaggg ggcctcgggc ctctggtgga ctccagatgc ggcgggggcag 18480
gcaccgggcg cctggcagtg acaggcaggt ggcctggccg gctcatggtg cagagggggt 18540
tcaggtgcag gaatggccgg cgtgagcaac gcctggggtg aggccaccgc cagctccctg 18600
aggaggcaga gactggaggg caactcctta ccaggtggtg cccaggagag gacagaaggc 18660
agtggccccg accccagggg ccccacgtgg cttgtgtgtg gcacgaccca ggatgagacc 18720
cacagggca ttaaagggag gtgacagggc taaaatcggg tgtcactagc acacctcgag 18780
gacggatctc cagggagaag ggggcctctg tcgggcctgg gtaccccag aggcaccctg 18840
tgtctcatgg gcacccacc ctcttacctg ggcagggctg gttccattgg tgacgggtga 18900
cggcagagga cctgtgggga cagcgtgtca gtggctgctc agccaccaca ccgcacccac 18960
cctgtgccct gggccgtggc ccaccttcca cgtgctcctc ggtgggtgtg acccgaagcc 19020
gcttgaagtg ttcatctgtc tcggggtcca cgaccagcag ccgggcctcg tcctcccgtg 19080
ccttgatgct ggccaccacc tcagcatggc gcagtccctc cacattctgc ccgttcacct 19140
gccgccacca gcatgtatca gccccgccat gggcccagac agcccccaac gccgcgtggc 19200
caggtgtggc atcaaatatt catcacagcc accgcccacc gaggcagcag gaggcgcacc 19260
agctcaggtt cccagcgtct ccctcctccc tgcaaggacc cagggcccca gtgtggacag 19320
gtgcggggca ctcggcaccc cgcagccctg gtgggccggt acctcaatga gccggtcctg 19380
ggcgcggagg ccagagcggg cggcaggtga gcccgggtcc acagagcgga tgtactggcc 19440
gggccgggac ttgtcactat gcaggttgaa cccatagccc tgaggtccct ttcgcaggtg 19500
gcagagccga gggcgcagct ccctcagggg cccactgaca tcctgcaggc ccaacgggaca 19560
gggtcagtct cttgctccag cctcccgcct ccagaggcca ctccccggtg gtgccgccac 19620
tgcccaaact cggtaccgtg cccccacgg gcaggcccag gtctcagtgg caaacactcc 19680
gggcacccag gctgcctgtg acagagcttt agctgtggga acttgggcaa agcctgtttt 19740
caaacccaga agcctccccg acgggcccag ccgccttccc gggttgctgg gagaattc   19798
```

```
<210> 31
<211> 6330
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AF037062

<220>
```

<221> unsure
<222> (1)..(6330)
<223> n = a or c or g or t

<400> 31

```
ccaggttttc cctcccttcc cccactcagc tgcaggaact ccttttttggg gtttggatct 60
ggtattttttc tattcagctc cgagcttggc tctcctgggg aatcctggga gtgaaaggaa 120
ggagctgggt ttatttgcat gtactggtag tcatttgcat cacatccaaa aatggccaaa 180
attataaccc ctgattcttg gctgaactgg gactgctgca atggaatatt attcccggaa 240
accacccccca actagctgga gctaatctcc tccctcctcc aacccccccat tttggcccag 300
gcctacataa accaaaaaaa gctggaccat aaggtgaaaa ccctacaggt ccaggctgcc 360
caatttgcca agcaaacagg ccattggatc gaaatggtga aaaacttcaa ccaggcactc 420
aaggtgggcc atactcccta cctcaccacc ccaatcctgg gcccccattg gctgcctcca 480
gtcaggttac ctcaggttta ggttaaggag gaagtagggt ggtcccagaa accccatcta 540
tagccccagt gtcagaaaag gttgagaaag aaagaaaagc agttggtggg tccaagttaa 600
agccttttcc aggagatgaa taaaacttat tccccaatgg aagccatagt ctacccattc 660
tgattcctgg gtcccaactc ctctccccct ttccaggaaa ttggggatgt ggagaatggg 720
cttggagcat tgagctggaa atgcgcacca ttgccaatgc aatggaatat gtttacaaag 780
ggcagctgca gtttgcccct tcctagcccc tgttccctcc cccaaccccta tccctcctac 840
ctcacccgca ggggggaagga gggaggctga caagccttga ataaaaaaca agcctccgtt 900
ttttttgtggt gtgtttcaga gaggtaatag ctccagtgtc gggggtggga gtggaaggtt 960
caaaggtggt ttccctgagg gacaggtacc ttttggggag agggtggaaa tagcttcctt 1020
ttactatccc aaatttttttt tcctccatgg cccttgtgca ggtgtttgtt aggcaagcag 1080
agggtgggag ttcccatccc tcctgagaga aggtcctagt agccctgccc caagcttcct 1140
aattcaggaa ttgtttccta cagaagagaa acaaggcaag tacacctggt ccccagctct 1200
ggctttctgc ctctccacgt gctcatggcc tctccccagg ctaactctaa gcagtgtcat 1260
gagtctgagc caggtgggag attaattcct gggggcactt cagggctgag aaggggggagg 1320
aatgacaggt ccagtaaccg ttaccaacag agcagtgcag ctgccatcct tgacagctcc 1380
ctcctccttg gagaccatga catagatggt caggaaccca ggctgagaaa gacagccaag 1440
gggtggggggg agcctaggca aatctggcct ctgccaagtc ctggcttcag ccaggcaagc 1500
tccagcctcc ctggctcctc ctcctcctca gtcctatccc caccctgtca cacatacact 1560
taatacgcct ggcatccaag tccacccact ccggactttg gccttagcag tagttagtgt 1620
gggaggctgg gaagactggg agcagtctct taaacaaaag caaagaata agcttcgggc 1680
gctgtagtac ctgccagctt cgccacagg aggtaagtgg atctgggagc tgggggaact 1740
gagaagacta gccagatatt acatgtattg ccaactcaaa actttcagct tttaacatgc 1800
ttcctcacac attatcccct ttgatcctcc acaactctga ggtggacctg gtgggtctta 1860
gccccacttg gtagatgaga aaataggttg agagagacag tgagatgctc agtatcacac 1920
agcaaacctc ttggccctat acatcattcc aaacacaaga cccaggttgc atatagaagg 1980
ttcagtgtcc ctggtttaga aggagaggtg gtgtgaggca agcaagaaga tgcctctgct 2040
gcactccagc ctgggcgaca gagtgagact ccatctcaaa aaaaaaaaaa aacgatgcct 2100
ctgctccata cagcaggtct gtacacagga tctggctcat gtggttttag ttaagttagc 2160
cacaaataca gggtctgccc acatctttgc tttgaacaga tgagccatgg ttggccaatt 2220
atctgccaac cagataattt ctcaatatgc tcacaccaga tgcttccagc tagggagggt 2280
attaggggaa agggcttgag ggccacagta aactggacaa gtttttctgc ccagcctagg 2340
ctgccacctg taggtcactt gggctccagc tatgtggctg cctcttctgc tgggtgcctt 2400
actctgggca gtgctgtggt tgctcaggga ccggcagagc ctgcccgcca gcaatgcctt 2460
tgtcttcatc accggctgtg actcaggctt tgggcgcctt ctggcactgc agctggacca 2520
gagaggcttc cgagtcctgg ccagctgcct gacccccctcc ggggccgagg acctgcagcg 2580
ggtggcctcc tcccgcctcc acaccacccct gttggatatc actgatcccc agagcgtcca 2640
gcaggcagcc aagtgggtgg agatgcacgt taaggaagca ggtaagtatg gtagaccacc 2700
aggaatatgg tgtggggtgt cctgatcccc acagtcaccc caggagtcac ctgcaagggc 2760
tgtggtaagc taaagggaca atttgaggag aagcagtctc cagatgctcc caggaagaag 2820
agggagctgt gggagtgcct cacctacccc cagcatcctt ttcatctccc cacagggctt 2880
tttggtctgg tgaataatgc tggtgtggct ggtatcatcg gacccacacc atggctgacc 2940
cgggacgatt tccagcgggt gctgaatgtg aacacaatgg gtcccatcgg ggtcaccctt 3000
gccctgctgc ctctgctgca gcaagcccgg ggccgggtga tcaacatcac cagcgtcctg 3060
ggtcgcctgg cagccaatgg tggggggctac tgtgtctcca aatttggcct ggaggccttc 3120
tctgacagcc tgaggtgagg ggtacagggc tctgggttcc aggactaaca gcagcccact 3180
caacaaacgt gggccagcag aggtggttaa aatacagcac attggaatag ttaaaaagag 3240
acagtttagg gctaaacttc atgggttcaa tgaagtctac ccttatgtaa gctttgtgac 3300
cataagtaga ttacttctct ttacccattt ttaacgtgtt tgttttttgt ttttgagat 3360
```

```
ggagtcttgc tctgtcgcca ggctggagtg cagtggcgcg atcttggctc accacaattt 3420
ccacccccgg ggttcaagcg attctcctgc ctcagcctcc cgagtagctg ggactacagg 3480
catgcgccac catgcctggc taattttttgt attttttagta gagacagggg ttcactatgt 3540
tggccaggtt ggtctcaaac tcctgacctc gtgatccgcc cacctcagcc tcccaaagtg 3600
ctgggattac aggtgtgagc caccacgccc ggccttgcct ctcgtcttta aacaataagg 3660
ttcaaagttc cgtgggagca caaaggagac atgatgagga caacgggagt tagggcctga 3720
gtttttttgg ttttttttttt ttaagcgttt tgctcttgtt gcctaggctg gagtgcaatg 3780
gcgagatctc agctcacagc aaccccctgcc tctcaggttc atgtgattct cctgcctcag 3840
cctcccgatt agctgggctt acaggcacgt gccaccactc ccagctaaat ttttaggtag 3900
agatggagtt tataccatgt ggccagggtg ggtttgaatt cctgacctca cctgatccac 3960
cggaccggcc ttcccaaagt gctgggatta caggcatgag ccaccacaca cggcccaagg 4020
cctgagttct tagcaggagt ataaggcgcc taagcttagt ctaccttcta aggaagcctg 4080
cgtttgtcac catcactcag caaataaccg gaattgtctc ctgtctctca gccttaattt 4140
ttcaggcagc atcatgggac acatactttt agtttttgaga caaggccttg ctctcaccca 4200
gggtggagtg cagtggtgca gtcacggccc actgaacttc aaactcctag gctcaagcag 4260
ctcaagcgat atccgcctca gcctcctgag tagctgagac cacaggcgcg tgccagcatg 4320
cctggctagt atttttttac agatggggtc ttgctgtggt gaccagactt gtctccaact 4380
cccggcctca agcgatgctt ccgcctgggc ctcccaaagt gttgggatta taggtgtgag 4440
ccactgcata ctggaacaca tactttatac ttgaatttttt ttttatcccc ttccttcgtt 4500
ctcctaacct atacttggat ttctacatct gtgccagggc agtgggatgt atccccactt 4560
tccccatcag cttaccctcc agcaaatacg agactatacc cttcaatatc cagcactcag 4620
ggctcaacca tgtgttttgg gagcaaggga atggggttcc tctaggtcag gaatcggcaa 4680
actcagtact caagccagat ttggccagct gcctacaagc tgataatggt ttttttttatt 4740
tttaaatggt tacattgtaa actgttatat aagtacctga taatatcatt aattttgttt 4800
cttggcctgc catgcttaaa atattaactc tctggccctt taagaaaaaa acgtgctgac 4860
ccctgctcta gatcaaagaa aacaaacctc aaaaatactt tcctccctct accccacttg 4920
acccttgtcc cggggcagta ggcatctccg tcaaaactct tgtccctggt ctgtggtaac 4980
tttctcagct ccccaaccca tgtccctcaa agtcccctcc ctatagggca agaacccagc 5040
aacttcgctc tgccccgact ctaggcggga tgtagctcat tttgggatac gagtctccat 5100
cgtggagcct ggcttcttcc gaacccctgt gaccaacctg gagagtctgg agaaaaccct 5160
gcaggcctgc tgggcacggc tgcctcctgc cacacaggcc cactatgggg gggccttcct 5220
caccaagtgt gagtagccag gcccacacag gggcacatga agggaaacaa gtaccagaaa 5280
ggccagtcct gcataagcct gctaggaggt gggtggggca cccagggcag ggttgagggt 5340
gaacaggatg ttacaanagt gcccaggcca tgtggaacct gcccactccc cacactgagg 5400
aggggactga gggtgacaag cccagggccc caaaaaacag tacctaaanat gggctggagt 5460
gaggaaggga aactgattgc aaccacctat ggggctgcag acctgaaaat gcaacagcgc 5520
atcatgaacc tgatctgtga cccggaccta accaaggtga gccgatgcct ggagcatgcc 5580
ctgactgctc gacaccccg aacccgctac agcccaggtt gggatgccaa gctgctctgg 5640
ctgcctgcct cctacctgcc agccagcctg gtggatgctg tgctcacctg ggtccttccc 5700
aagcctgccc aagcagtcta ctgaatccag ccttccagca agagattgtt tttcaaggac 5760
aaggactttg atttatttct gcccccaccc tggtactgcc tggtgcctgc cacaaaataa 5820
gcactaacaa aagtgtattg tttaaaaaat aaaaagaagg tgggcagaaa tgtgcccagt 5880
ggaaggctga ccccattttaa gtgccaacta ctccaaaccg acatgctcac ggtctctggc 5940
ctgttcagtc cctgcaaaac agctagcacc cacagtgggg cgccagggaa ctgcctcaca 6000
tctacagctg cacgtcgggg agtggccatc aaagggcact ttaatacatt tcccttattt 6060
tctgaagggg agtaaggttg caattcagtg tctgtactgg gaatggtctt catatttctt 6120
ggggggagaag agcaggtgat gagggttctg gccaggctg ggtggcttcc atggaagaaa 6180
aggcaatatt cacataaatt ctcctgctaa ggacactgac cacacaggtg tgcaaggcaa 6240
cttatcatac ttcgaaggaa gctggatccc ttgaggattg gccaggaagg gaggtgctgg 6300
gcccttagcg gtgcacagaa ggccaggaag                                    6330
```

```
<210> 32
<211> 10884
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. M35878

<400> 32
ctgcagacct gggacctcaa gaattgcatt tgatgccgaa cccagctcta atttcagagt 60
```

25

```
caaggtctct gcgagtattt aaggaacgga tgtaaacctg ggggattcgt tttgtttcct 120
tcaattttcc aatgaaatca gagatcctgt tcttgggtgt caacgcagat actagaagga 180
ggtgatacaa gagaaaggaa acagcaagcg acgattatgg cacggtttcc tgtaaacaag 240
gttgagtgta gccacagcct gagcactgtg ggagaagagc tcataagaaa atgacggtgc 300
tgggccttcg tcaccccggg gccctccatt gttcttgtct ttggtctctt tttatttgta 360
gaggtccaat tatttattta tttagtacaa gagggaacga aattgatctt tccattctaa 420
aaggagagta tatatgtata aaaggaagct gtatagatat gggggaagag gtggacaggg 480
ggaaaagggg agaggacgag agagagaaag ggagggagag ggacaaggag agacactggg 540
cgagagatcg attaggagag acagaaatga tgaatgaaga ttaacttcac ccaaggcttc 600
gtcgctggag gggaatggag gagctcctga tttgctatta ctactccaaa ctgcaaaggg 660
ctccttcaag tcacctatcc acctcctaag gcaagcgtcc aatttcaaca gcgttcagga 720
aagtctcctc ccgcggaggt ctcaccgctt cccactccac ccccacaaac tctttggaaa 780
agtgccttga aaaatttaat cctcaatcca atcctggacc accagcgtcc tctgttggtc 840
accgaaggag ggggtgcgca gacaaaactg aagaaactcg agtgccagag aaggccgaca 900
ggagttacag cgacctcagc gcgcaattgc gccccgaact ttactgaaaa gtgtttagat 960
tgcagagata agctagaatc ccaacgcatc gagaatacag taatacgaag tcgccttcaa 1020
aaaatgacaa tgaaaattgc ctattaaagg actatttggt taattacgtt tcagcagtgc 1080
ccagtttatt gtctttatta ttcttttgtc gtgggtgtaa actccatttg aaaacataat 1140
cagggagaat acccaagaca agaagaacag ttgtcattta aaatatttga aaagccctgc 1200
cttaaggagc attcgcttgc cggtccactc ttaattgggg acttgcggtg tagcaacacg 1260
tgagagtctt cttgcgttga gaagtaagcc tggaaaggcg aaggccccgg ggcatcttca 1320
gatgcgtatt tgtgggcccc tggggatata aacagcccag cgggtgtaaa ttaaaccccg 1380
cagtgccttg gctccctgag acccaaatgt aagtcagaaa tgtcccaaga cttcgcctgc 1440
caacggaatt aaattttaga aagctccacg aggtacacac gaatgcggag cgctgtatgc 1500
cagtttcccc gacaccggct cgccgcaggg agacctcacc ccgagagcgg aaggggtaag 1560
ggcggcgggg tcaaggagat cgggggtgct gagttggcca ggagtgactg gggtgaccgg 1620
gggtgctgag gtggcctgga gtgccggggt ggccgggcac accttggttc ttgtagacga 1680
caaggtgacg ggctccgggc gtgagcacga ggagcaggtg cccgggcgag tctcgagctg 1740
cacgcccccg agctcggccc cggctgctca gggcgaagca cgggccccgc agccgtgcct 1800
gcgccgaccc gccccctcc caaccccac tcctgggcgc gcgttccggg gcgtgtcctg 1860
ggccacccg gcttctatat acgggccggc gcgcccgggc cgcccagatg cgagcactgc 1920
ggctgggcgc tgaggatcag ccgcttcctg cctggattcc acagcttcgc gccgtgtact 1980
gtcgccccat ccctgcgcgc ccagcctgcc aagcagcgtg cccggttgc aggcgtcatg 2040
cagcgggcgc gacccacgct ctgggccgct gcgctgactc tgctggtgct gctccgcggg 2100
ccgccggtgg cgcgggctgg cgcgagctcg gggggcttgg gtcccgtggt gcgctgcgag 2160
ccgtgcgacg cgcgtgcact ggcccagtgc gcgcctccgc ccgccgtgtg cgcggagctg 2220
gtgcgcgagc cgggctgcgg ctgctgcctg acgtgcgcac tgagcgaggg ccagccgtgc 2280
ggcatctaca ccgagcgctg tggctccggc cttcgctgcc agccgtcgcc cgacgaggcg 2340
cgaccgctgc aggcgctgct ggacgccgc gggctctgcg tcaacgctag tgccgtcagc 2400
cgcctgcgcg cctacctgct gccagcgccg ccagctccag gtgagccgcc cgccaggtgc 2460
gctgcgtgca gcaccgccac tggcgccgaa gggcctgggg gttgctgggt gccgctgcgg 2520
gagactccgc ttttcttctc actggagata atatgtgggg aaactgaagg cgctccggga 2580
aaggtgaagg cggtcgccga gggaccctcc ccagccggcc ctctacttgc tcgattctct 2640
aagtgcagag tacttgtaaa ttgcaaagcg ctttcagtga aaatgggtaa aggtttccgg 2700
agctgagggg agcggtaccg atgtttagct gttggaaaga tcctggacac aggagattct 2760
cctcgccccg cacgggtgca cacggactgc aatcccaggg atgcttgggg atggggggat 2820
ataggcggat ttggaccaag gaaggtgggt aggcacgttg taggaaatag tacctctctt 2880
ttaaaatact gactttgcac agccttttgg tttgcaaagc aatgtctagt cccggtatgt 2940
ccaaaaacaa gtaaagtgga ttcgggtttt gatatcttct gcggttggaa aacctgaagc 3000
tgaaaagaa gtaacttctt aaggttaccc agcggccaca acagagtgta ggtttgaact 3060
ccgcgtgcca cttcagtac cataccattc ttacaactcg gccacccct gcacctgcgc 3120
cgacctcaaa caaacttcca ggtgcgtggt gggtgcgggc aatgtggact aagtcaattt 3180
caatgacacg gcaagggaat tggaatcagt cctaggctgt ctcccttctt aatctgaaat 3240
gggggggggg aatgagatgt tgttaaggg agccccagaa gaggaaaaat gcaaacattt 3300
ggcagagtta ccctccttgct tagccactat cagtatcagg cagacagcga ctctggtaag 3360
ggcatcacat tgttccctta aaaaaaggag cgggggttgt ttaaatggat ttggcagctg 3420
ttctttcaag cattcttagc cagcctcacc tagttatatg agaaataaag ttcctgcctt 3480
gcacagctga aggctgggag aattctcccc atcctaattc ccccaactcc caacgatca 3540
cgttggacag atgtcactgg gcaggccccc atctagggct agcaggatga acagtccctt 3600
tataatttat gtagctgtag agttccacgc ccgggtgaag ttattttctg gctcggcaag 3660
gctggctctg ttcacccctg agaaatgctg gattcatgga aaggcaagat gcctgaaaca 3720
```

```
tacactggct ctggtcagct gttaaagctg ctggaggcat ttgtctctcg gggcaaagtt 3780
atgtcatttg ccaagtgtcg tacattattg tgcatttttg ggtattcaaa aagtgatctt 3840
agaaatactg atacacatcg tcattcttgg gctttagcaa tcatcatgat taccaccttta 3900
gtagcactgt agtataggtt gatgtgagtt ataagattat aaaaagatct aagtgacttc 3960
tagaatctat ttgacaaaaa aaggtaaatt ttcgacagtc aaaagtcaca attatctgtt 4020
gcttaaatag aactgttttg tcttcatgcc ctagtctgca gcccaggcat taagaagaaa 4080
ccaaggaaat ttaagaaatt actcaaggtt cttagaaaag aagtataaat acgtttattt 4140
acatgttctt agagtatttta cattcttagt atctctttta tctcagtatt tccttgaaaa 4200
agaaagcaag ctaagattaa aagaaattga aaccaaatcc tcgcaggtag ggacctcctc 4260
tgtgaggctc tgtgctggac cctgggaatg tgtgcttccc aaggtatgaa accccttggg 4320
gaactttaca gcaggacctc agtgagctgt ttggcaggtg aggaaactaa gacccagaga 4380
ggagagggac tttcctaagg ccctggtgag tgacctgcca gtagccactt ccagggggaga 4440
gcagagcatc tgcagccaaa tcattgcagc cccaggtagc tttctagata gactgtggac 4500
cagatgggcc acctgagctc cctgctaggg ttacacatta tagccctgtt tgtgtagtag 4560
agaaatttca tgactctcaa ttgtggactt aagccgatgc ctccagacct tggcatggtc 4620
cacaggccct gggagcatgg gctctgaatg tagcctttga tccccatagc ggtcttacag 4680
cccctccaag ttcattctga agaaggaatg gagtgagaat cctggctgca gatccagtct 4740
tgaatttagt catatactta aaattccaat tcaactgtta acattccagc atccatttta 4800
agcatcagac tttcttcatt tagcactttt tattataaaa gggagatctg ctggagggggg 4860
atttctccta ccccacccccc acccagggaa ggaaaagctc tttggcactt agaagtctga 4920
gccgtgagtg ggactttggc attgtctgca tccatgtgct gctgtgttca cccggggtga 4980
aaaggactca cttaggcagg caccagcaag atgcacaggg tctgtgtaga ccttgagttt 5040
tagagatgta acggggacct agaaaacaag ccaccaacat gcttgcatga ttctgagccc 5100
ctgaggcaaa acgctttgca ggtaataatt cagttttccc atctgagctg gacaccaagc 5160
tcttataagc gtgtttacct ggtagcattg aggacggtac tggtcaacct tggaattccc 5220
ataagggctt gttacaactc agactcgtgc cgccactcca gcgtttccgg agtggagaat 5280
gtgcatttct tccaagtccc cgggctgccg ctgctcccgc gggtgggagg accacacttg 5340
gagttgactg caaaatttct gagccggcgc tgcagcagcc tcccgtggct caggtctgcc 5400
ccctgccggt ggaagatgaa gcatactgcc ttcacctact gaggggcact gaagcgtttg 5460
tctgccttct ttagttgcag ctacttagga agagcacctg tcagattgac tttcaaacag 5520
ataacttctt gaggtagagc aaccaccatg tagtgagtag tatgatggaa taatacttca 5580
tcgaggtatt taaaaaaaaa acctcacttg gattgccaac taatattgtc atttacatgt 5640
gacctggttg caacgttaag atttttacaa gactgtgata gatattgatg actctcatgt 5700
gtttgtctct cttgggcgtt ttaaggaaat gctagtgagt cggaggaaga ccgcagcgcc 5760
ggcagtgtgg agagcccgtc cgtctccagc acgcaccggg tgtctgatcc caagttccac 5820
cccctccatt caaagataat catcatcaag aaagggcatg ctaaagacag ccagcgctac 5880
aaagttgact acgagtctca gagcacagat acccagaact tctcctccga gtccaagcgg 5940
gagacagaat atgtgagagc ttttcctctt gttaaaggag gagggcaaga cctgccaagc 6000
ctgggtactc agagcctctt gagggcaatt cttactcaac aaaccccagc gcctggctga 6060
tgggtgggca accctagcc cctctgtgcc ctacctctct cctctcctta cataaagaat 6120
attgacccctt ttggagaatc ttatgaggat caagctgaaa taacactctt aaaagcatat 6180
gggatgtcat aaagacctct gcagataatg aaaatattct cataaagata gtttttattta 6240
cttcatcctc tatgcttgtt gacctgctat tggttccatg ccagcttctg tgccttactc 6300
tgggaagagc aaaaaggaga cagggagtga tggttagctt attcggggga cttttcgtgct 6360
acatcagaca taaggtatct gaggagcaaa ttacaggtcc cacttttggt agttgtgcag 6420
catcgtaaga ttttttaaagc acacattcta gagtaaaaac tgtgactctg ttgctctggt 6480
ccttcctgat ccccagggtc cctgccgtag agaaatggaa gacacactga atcacctgaa 6540
gttcctcaat gtgctgagtc ccaggggtgt acacattccc aactgtgaca agaagggatt 6600
ttataagaaa aagcaggtga gtgaggccca gctcttgtgg ccatagctct aactctgagc 6660
agaggagaaa cccatgtcac cagcgcccag gctcttgtgg ccatagctct aactctgagc 6720
ctgtgcagca ccagtgccca ggacttggtg ccagtctcag gaggtcagac caagggctgc 6780
tttgacttgt tgctctgagt gctgctatat tggccataat cctcaaccct agtgcctttc 6840
caccacccgc ttcccactcc tgtcctttca atggttcacc cacaggcgga caagatgctg 6900
cccagtggca cccttttataa actgcaagtg gacatgttaa cacatttgtt aatgctgcgt 6960
cagggagtga catttcaaac aactattata gtcagtttcc aagaagtgtg acatgaggtc 7020
ataccacaaa aaagcttacc ctgaaatccc acaatcgtcc cctttcctac tgatgccttc 7080
ccgatagtga gcaggttgca atattaagat tttgaaaagg ctgttgctag atgttggtga 7140
ctcgtgtgtc tctgtctccc ttgggctttt caaggaaatg ctagtgagtg gggggatgac 7200
tgcagcatgg ccagcttgga gagcccagcc atcccagca cataccaggt gtctgtcttg 7260
gcgtggaggg gatggaactt gaaatcagac actcggtcca tgctggggat ggccagtctc 7320
tccaaactgg catgtggtct tcctccgagt cactggcatt tccctagaaa gtccaagtga 7380
```

27

```
gaagaaggca tgagagtcat caacatcaaa caacagtctt ttcaaaatct ttatattgca 7440
acatagtccc attcctggaa aaggaatgga gtgagaatcc tggctacaca tcagccccaa 7500
atgtagtcat tgcctaaaat cccaattaac ctgaaaatga tcaaacaaat ttaagatata 7560
gtaatattaa gctgtaataa atatgcttct ataggctttg tgttatgtga tggcactatt 7620
tcaattggct ttctaattgg acaattgata ctatgctatc tacagaattg gcctttggag 7680
acctaagtga gccacagtgg cctcagggtg accatatact aggattcata gcagtggcca 7740
cagtcagaag cctaagcttt cctccattgc cattgctcgt ttataccacg tttctgtcaa 7800
agtcatattc attcaacaaa gtcatactga gaaggtgtca tgtgaggctg gatgtgggct 7860
ccaaagtcat agctgtgaca ttcgcaggca gcgggatgtt ctcagttcca catttggcag 7920
agaagtcagt caagaggttc tacaagggct ggtgtccacc ttatactcct agaaacacaa 7980
aactgccccc accccgcctt tcttggagca ggaagttaca cccacacgca tgcacaggcg 8040
cacactcagc gggcctaggc agcgtggctc ttgtgttgcc ttagctgaaa tttctgttgt 8100
gctttctcag catagcagag tcacgctggc aaaccatcat gcgccctggc caccgacctg 8160
acaccagacc caggagcatt cacttctctg tcttctgttt ctctcccaca gtgtcgccct 8220
tccaaaggca ggaagcgggg cttctgctgg tgtgtggata agtatgggca gcctctccca 8280
ggctacacca ccaaggggaa ggaggacgtg cactgctaca gcatgcagag caagtagacg 8340
cctgccgcaa gggtgagtac tcaggagggg cagcctgggc tccagggcct cactgtcctt 8400
ggaccagcct caggggctgg gcgtggccac tggccttccc caggcttaca gacccaggag 8460
ctgcagctca gggccagaaa gagcaaagca aataggacag agccctcaga agggtgcagg 8520
gagagggaga ccccatcaac ccaaccaaac aagtgtgggg aaggaggccg gccagtgcac 8580
ctcagggaca ctctgcttta tctcagatac ctcacagcac ctaagctatc attcatccac 8640
acacaaagtg aagattttca aagttaggct ttacccgtga gtctggaggt catttatctt 8700
cacagagaac gtttatcgca gactgctaag atacatgttc taattaagat gtgatgtgag 8760
aacgctgaat gctcgttgga gactcagttg aagtgcagct ttttttctgt caaatatata 8820
atgaatattc tgttagtctg tggctaatat aattttaata aagttaattt aaatctgata 8880
gaaaaatgaa attttaaacg ataatttag agaatgctat tatatccagt cttctttttt 8940
ctttttaataa atgagggaac tattggggga aaggaataaa tacattttct ttcattttat 9000
taagacaaat ttagtaagca gaagaaattt gcatgtttag ttataagggt ttctttttc 9060
cttacaagtt ggaaaaaata attctaattt aagggtaact ctttgacaat gaacactgtg 9120
agcagcatct ggtactcgtt gctttgtttg aaaacatgag ttgagacccc agccgcactt 9180
gcagcctagt gccattagcc tgcaggctgt gctggatatc tcagggcaag agtcgagccc 9240
ttttgatttt gggggggatta tttcaatata tttgcttttt ctttttgttt tagttaatgt 9300
ggagctcaaa tatgccttat tttgcacaaa agactgccaa ggacatgacc agcagctggc 9360
tacagcctcg atttatattt ctgtttgtgg tgaactgatt ttttttaaac caaagtttag 9420
aaagaggttt ttgaaatgcc tatggtttct ttgaatggta aacttgagca tcttttcact 9480
ttccagtagt cagcaaagag cagtttgaat tttcttgtcg cttcctatca aaatattcag 9540
agactcgagc acagcaccca gacttcatgc gcccgtggaa tgctcaccac atgttggtcg 9600
aagcggccga ccactgactt tgtgacttag gcggctgtgt tgcctatgta gagaacacgc 9660
ttcacccccca ctccccgtac agtgcgcaca ggctttatcg agaataggaa aacctttaaa 9720
ccccggtcat ccggacatcc caacgcatgc tcctggagct cacagccttc tgtggtgtca 9780
tttctgaaac aagggcgtgg atccctcaac caagaagaat gtttatgtct tcaagtgacc 9840
tgtactgctt ggggactatt ggagaaaata aggtggagtc ctacttgttt aaaaaatatg 9900
tatctaagaa tgttctaggg cactctggga acctataaag gcaggtattt cgggccctcc 9960
tcttcaggaa tcttcctgaa gacatggccc agtcgaaggc ccaggatggc ttttgctgcg 10020
gccccgtggg gtaggaggga cagagagacg ggagagtcag cctccacatt cagaggcatc 10080
acaagtaatg gcacaattct tcggatgact gcagaaaata gtgttttgta gttcaacaac 10140
tcaagacgaa gcttcttct gaggataagc tctttaaagg caaagcttta ttttcatctc 10200
tcatctttg tcctccttag cacaatgtaa aaaagaatag taatatcaga acaggaagga 10260
ggaatggctt gctggggagc ccatccagga cactgggagc acatagagat tcacccatgt 10320
ttgttgaact tagagtcatt ctcatgcttt tctttataat tcacacatat atgcagagaa 10380
gatatgttct tgttaacatt gtatacaaca tagcccaaa tatagtaaga tctatactag 10440
ataatcctag atgaaatgtt agagatgcta tatgatacaa ctgtggccat gactgaggaa 10500
aggagctcac gcccagagac tgggctgctc tcccggaggc caaacccaag aaggtctggc 10560
aaagtcaggc tcagggagac tctgccctgc tgcagacctc ggtgtggaca cacgctgcat 10620
agagctctcc ttgaaaacag aggggtctca agacattctg cctacctatt agcttttctt 10680
tattttttta acttttttggg gggaaaagta ttttgagaa gtttgtcttg caatgtattt 10740
ataaatagta aataaagttt ttaccattaa aaaaatatct ttccctttgt tattgaccat 10800
ctctgggctt tgtatcacta attattttat tttattatat aataattatt ttattaaaat 10860
gttccctgct ttccctttta gcaa                                        10884
```

<210> 33

<211> 8322
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. D50030

<400> 33
```
gaattccgtg actccagcac catcccaggc cccagggtac ctggcccagg gttgtgctgc 60
cgcagacttg gcctgtacca tccaggcggc ggtggggagc tggggttgga aaggcttctt 120
ggagtggact cctgggtctg tctgggagac ggggaggaag ggacactctg aacatcacca 180
ggggctgctg gggggccctg gccaccccca gagtcagaac aggcaggtgg ggcaggatct 240
caggtcatcc tatgctacac tcagccattg cgtggcccct ctcctccctg tgcctggcct 300
tttggccagc cctggggcca ccgagaggat gcagcaccga accctccagg agcccccagt 360
gctgccgtct gtgggacagg gacaatccca tccccactgc tactgtctgt gctgtgctgg 420
gcacagagct ggacacctcc aaggcccagc gcccgtagtg gctctcatca tggacaattc 480
acaggcagat ggtggccagc tctgtggcct gcagggactg ggagcggcgc cagaccatct 540
aggccccaac ctatctgcat tatcctggaa gacttcctgg aggaggcttc taagctgagg 600
cccaaggacc atgtcaggtc taggactagg accagtgcag gccgaggcca gagagacagc 660
tgggcttcca ggtagggtca aagtgaggtg ggcagcaggt gtggggggcca ggggactcgg 720
ggacttcctc tccggctggg cccgcctgac gtgggaggca gccagggtta atcatttcca 780
cgaagccttg accccacctg ccttggccgc tctggagggc gctcccactg cccctcaggc 840
cagctcagga gccatggggc gctgggcctg ggtccccagc cctggcccc caccgggggct 900
gggccccttc ctcctcctcc tcctgctgct gctgctgctg ccacgggggt tccagcccca 960
gcctggcggg gtgagcactg accttgtcgc agtgcgcaca gaggttccca gtggctactt 1020
gggaggaggc cagagggagg gtcgccgcag agctggggat ttgaggggggc ggggtccga 1080
gcagggggct tacgttgaaa gctggccctc acagggcagg tgggtgctgg actggccttg 1140
gaggctgggg cctgggctca cggagcccca cctggggggct gtcatccctg tgcggcctgg 1200
cctgggcccc tatgggtctg ggggctgccc cctctctctg gacctctgtt gggtctggat 1260
gcgtgaggtt gggggaacct cccagggcct cctagctgct cccatcacca aaaactgacg 1320
tcagggttta agcttggtgg gtagcagtgc ctgggcctgg gcagtgaccc tgagcaggtg 1380
ttaactaggg gccgagggcg gggaaggtgt cagggcctgg ctgaggcctc aggaatgtcg 1440
tgtgtctcct ggaacctgct ccgagatctg ggggccccag tatggaaaca ggctcagggc 1500
tgtgacctcc tgcccggcag gacctgagtg tgaggtctg tcccacactg acacccttttc 1560
tgctcctcct agaaccgtac ggagtcccca gaacctaatg ccacagcgac ccctgcgatc 1620
cccactatcc tggtgacctc tgtgacctct gagaccccag caacaagtgc tccagaggca 1680
gagggacccc aaagtggggg gctcccgccc ccgcccaggg cagttccctc gagcagtagc 1740
ccccaggccc aaggtgggtc aggtgggcct gggaggaggt gtcgtgcttc accttagggc 1800
tgggtgggag gagcatggct gcggctggag gtcctgaggg gctcgggtgc ccctcgaggg 1860
agccctgacc ctgccacccc ctccccacag cactcaccga ggacgggagg cctgcaggt 1920
tcccttccg ctacggggggc cgcatgctgc atgcctgcac ttcggagggc agtgcacaca 1980
ggaagtggtg ggtccgggca gccggggcac ccgagctggg gtcacctgcc ccacgctgcc 2040
tgcttttctg ggagccgggc acacagtagg cgctcaccac gcagcaggcg gacccagtga 2100
acccagagac cctccagggt ggtggggtgg ggtgggggggc ctctgcctgg gacccccatg 2160
cacgcaggtg tcgccccca ggtgtgccac aactcacaac tacgaccggg acagggcctg 2220
gggctactgt gtggaggcca ccccgcctcc aggggcccca ggtgggtgct gggttgggta 2280
gcctggggcg agcaggggggc actgggccag gccagaaggg ccaagggggag gatggggcgg 2340
acccgggcag gggtcctggc tggaggggag cagaagagga gctctgggat taacccggt 2400
gggtgccact tagggccaga gcctctccca ggtgggacct gcgtctcatg gtgcgtgcgc 2460
ggccatcgct ggggccaagg cgccgcctgg tggtgaggcc gggccctgca gccacacagg 2520
cgtgccccag gcaggggaca ggtgggcagg gtctgtgggg tgcggtgcca gccgccctgc 2580
tcacatgggt cctgggacac atgggagggg tctgctgcct gacagtgtgg gtgtcaggct 2640
tccaggaagc cacgtgcaca gctgggccag tggcccaggt gttgagtggg ggacgctggg 2700
aggaagggga ggtctgtgcc cctcccaggg accttgcacc ccgaggggcg tagagagggc 2760
ccctttgctc tcagagcccc tcactgacct gatggacgcc ttagcaagca gagaatgtca 2820
cagagggacc ctgagcctcc cagtccgccc ctcacatccc ctcccgcatg tccccagctg 2880
ccctggatcc ctgtgcctcc ggcccctgcc tcaatggagg ctcctgctcc aatacccagg 2940
acccccagtc ctatcactgc agctgccccc gggccttcac cggcaaggac tgcggcacag 3000
gtgagctggg cccggaggtc cgcagggtcc aggggccgga gcaagtcccg gaggatggga 3060
gaacaggtgg ctcccgagtg cagggcaggg gccctgcacg gggacagcag gtggcagggt 3120
gtgagggctt actgtgcacc cctcagagaa atgctttgat gagacccgct acgagtacct 3180
```

```
ggaggggggc gaccgctggg cccgcgtgcg ccagggccac gtggaacagt gcgagtgctt 3240
cggggccgg acctggtgcg aaggcacccg acatacaggt gcgccacggg gtgtgagccg 3300
tgccactgac ccctgacggg tgtccctgtc cacacccgag tgggaggaat ggcctgaggt 3360
cacccagaaa caagggacaa ggggtggacc ccggccccga ctccgctgtc gtggggcact 3420
gcgcggcccc tggcccagct cctcggccct gccccagct tgtctgagca gcccttgcct 3480
gaacgggggc acctgccacc tgatcgtggc caccgggacc accgtgtgtg cctgcccacc 3540
aggcttcgct ggacggctct gcaacatcgg tgagtgggtc agcccccgg ggtgccctgg 3600
ggcagtgccg ggtggaccca ccgtgggccg gcctcactgc ccctctgccc gcagagcctg 3660
atgagcgctg cttcttgggg aacggcactg ggtaccgtgg cgtggccagc acctcagcct 3720
cgggcctcag ctgcctggcc tggaactccg atctgctcta ccaggagctg cacgtggact 3780
ccgtgggcgc cgcggccctg ctgggcctgg gcccccatgc ctactgccgg tcagcaccaa 3840
cgccgctcca ggccgccgca cgcggggcag gcaggatttt tcctggtgag aggccccccg 3900
gctccctagg acccaggcgg ggccatctcc gtccagacag gccccggaac ctctgcctgg 3960
gaggctgccc gagggagggc cactctcttc ccgctgctcc aggtgcgggg aaccgccctg 4020
ctgggggttc cgatgccccc tccccatgcc ctcttcgagg ggcagtgtga ctccctgcca 4080
gcccccactt atgcaccgca ggaatccgga caatgacgag aggccctggt gctacgtggt 4140
gaaggacagc gcgctctcct gggagtactg ccgcctggag gcctgcggtg cgcggctggc 4200
ggggggtgct gccttgggcc ccaccgaggt cacagcagtt ttccccgtga tcctcctagc 4260
ccctctgcac acctggctac tgcatctctg acaaatgggg aaactggagc tcacgggatc 4320
aggctggtcc aaggtcacgc agtgggtcgg tactggggtc acagtgggga agcagcccgc 4380
tgcaggggc tggtcaccag gcgacggcct cggggtggca cctgcccagc ctggaccatg 4440
cccaggatgg ccgcagaagc ctttcaggga ggtgcaggga gggcagcgtg caggcccccc 4500
agaggccacc tgcttcctgc cctggggaga ggcccccggg ctccctagga ccccggcggg 4560
gccacccggg gctctcatgt ggggggtctct gactgtgctg gggctggctg tggggttccg 4620
ggctgctgag ggggccacaa aggcctccgt gtgtccagcc cctctggccc tcacagagcc 4680
tcgggatcgg gcatcaaacc ccattctaca gatttggaaa ctgagggcag aggtgagtgg 4740
gcgccagggc ctgagcagcg tggacagggg gtccggccat ggccctctgc agcgcctcct 4800
gccgggtagg gcctgtgtgt ggaagggggc tggccctgtg aaccccaggg gtgtgacccg 4860
gtgacctttg ctcccagaat ccctcaccag agtccaactg tcaccggatc tcctggcgac 4920
cctgcctgag ccagcctccc cggggcgcca ggcctgcggc aggaggcaca agaagaggac 4980
gttcctgcgg ccacgtatca tcggcggctc ctcctcgctg cccggctcgc acccctggct 5040
ggccgccatc tacatcgggg acagcttctg cgccgggagc ctggtccaca cctgctgggt 5100
ggtgtcggcc gcccactgct tctcccacag gtgcacctcc tctgggcccc agtcacctgc 5160
cctgaggccc cacacaccat ccagcgtcac tatgcgcctg tccccacccg cttgcggacc 5220
ccatcccggt gcctctgctg acccccttccc gggggtccccg gtaaccctct ctgaccccctc 5280
tgggtcttgg ggctcagtcc tgagctgggc atgcatggac actccagaaa ccctgtccct 5340
attgagggag gccaggggtc agtggcattt ccacagagga cccagcgcct gcggagagtg 5400
cagtgggcca ggtcctgtcc tccccgcagc cccgcccctc ccagagtcct ggctctcagt 5460
agggagccag ggagcgcagt acaatgcgtc agagccctag gagcccaagc acagccaggg 5520
aaactgaggc ccagcccact cagccggctc ccctcagtgg gggcgcacag ccacccaggc 5580
ccacactctg ggaggcgggc ctcgagtggg gagaccctga gacggagcag cctgggccag 5640
acgcccttcc accttcgatg ggcaccccag tgattagggg caggggtccg gccagccgag 5700
ggtctggcgg cctttcgagg accacagctc ccagggtggg gtcctgcgtg gccctgcaga 5760
acctgcagcc gacgtctcct gggcctgcaa atggggccag agccttcctc agtgtggaga 5820
aatggggttc cccacatgga gcccagggca ggaggccgag gcagggtgga gcgacctcca 5880
cacagcagat gggagccagg ctcagggggcc caggctctgt gcccagcagg agtgagggct 5940
gcatctgggg acccccacaat gtggatggaa gctggggcag ggcctgagca ggccaggtct 6000
ccacccactc gggtcggcct tgcagccgat cctgcctggg cttggcctga gactccccccc 6060
agggcttgtg accagtgttg tcaggaggga tggcaccgca cttcagctcc catgcctgga 6120
tctggggggtg actggcaata gcccctgctt ggtggtccct gtctccccag tatcaacagc 6180
ccacacccag gcacctgctc agaccccctcc ccgggaccag ggtcccacac cattggcctc 6240
cgtgggcctg acagggggtg gggagaggtg agcccggtgg ctgggggagg gctggtccat 6300
gcagcctcca gccccccttg cacagcccccc ccaggacag cgtctccgtg gtgctgggcc 6360
agcacttctt caaccgcacg acggacgtga cgcagacctt cggcatcgag aagtacatcc 6420
cgtacaccct gtactcggtg ttcaaccccca gcgaccacga cctcggtgag ctccggcgtg 6480
tcgtggctgc actctgggca ggtgggccct gtgctcccca ggccaggccc agacaggggc 6540
aggagctggg cagacatgtg gtgcggggga agctgggggc agggcaggga ggacagggac 6600
cgtcccttct ggatctccca ggctgccctg tggaccccac tggctaccct ccctccacca 6660
cgggccccga cagcctcccg ttcagcccgc acaccacagg ctgaccctgg ccactcttct 6720
gatcagtcct gatccggctg aagaagaaag gggaccgctg tgccacacgc tcgcagttcg 6780
tgcagcccat ctgcctgccc gagcccggca gcaccttccc cgcaggacac aagtgccaga 6840
```

```
ttgcgggctg gggccacttg gatgagagtg agttgggagg ggggcgccca gcgtccgcca 6900
ggtggacagg tggccagcca cagtgtggtg tcacgctgag ggcattgtgt ccacagacgt 6960
gagcggctac tccagctccc tgcgggaggc cctggtcccc ctggtcgccg accacaagtg 7020
cagcagccct gaggtctacg gcgccgacat cagccccaac atgctctgtg ccggctactt 7080
cgactgcaag tccgacgcct gccaggtgag ctggtgcccg ccccaccagg acccgactgg 7140
tgggggctca gctggtcctg agtctccgag atgcttgccc ctggggagcc cagagcctgg 7200
cggcacccca acctggcagg gccagccagg gacccctggg cagggagcac acttactgtc 7260
ggtggccagg caccccaggg ccacccagag ccctgccgga agggcatcct cctcacacag 7320
aaggggagac ccaggctctg agaggggcct ggggtcccac agagcccgga cagttcctgg 7380
ctgtccagcc caaggcagtg ctttccgtgt gacactaggc accaaaggcc cctttgcccc 7440
gagttctctc aagccagctc ttcaaccttc aataagttct tcaaccttca ataagcccaa 7500
cagcccaacc acgtcctggg ctctgcagcc tgtgtgctca gcgcacgcac ctgcatgcga 7560
cggctctctt atgccccatt tatagctggg gagactgagc cccaggcagt caattcactc 7620
ttccaaggcc acaaagccca ggagtggtag agtgggtagg gcttgtcact ggacctcgat 7680
aagggaagtc aggatggttt cctggaggag ggagtgtttg cactggtcct gagtgatgcg 7740
taggagtttt ccagggagtg aagaagtcat ttcaggaggt gctgggacac agggtggctg 7800
tgtggtccac acagggttca tgctggtggg gagagggga ccgtggcttc aggaagggga 7860
ataacgtggt tggatgccct ggcccagcca gtgctgcccc cagggaatga gacacctttt 7920
catgaggttc aggagagtgg atcagctccc ttgctcagaa atgcctttgt cctctgtccc 7980
caagctgcca cttggggtag aggggtgtcc ctgaaccagg cccctgggag ggtggctctg 8040
accaacgtct ctgcccaggg ggactcaggg gggcccctgg cctgcgagaa gaacggcgtg 8100
gcttacctct acggcatcat cagctggggt gacggctgcg ggcggctcca caagccgggg 8160
gtctacaccc gcgtggccaa ctatgtggac tggatcaacg accggatacg gcctcccagg 8220
cggcttgtgg ctccctcctg accctccagc gggacaccct ggttcccacc attccctgcc 8280
ttgctgacaa taaagatatt tccaagaacc cggcccacgc tg                8322
```

```
<210> 34
<211> 2576
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. L04751

<400> 34
gaattccgca gagatccagc aggtgctgca ccatgagtgt ctctgtgctg agccccagca 60
gactcctggg tgatgtctct ggaatcctcc aagcggcctc cctgctcatt ctgcttctgc 120
tgctgatcaa ggcagttcag ctctacctgc acaggcagtg gctgctcaaa gccctccagc 180
agttcccgtg ccctccctcc cactggctct tcgggcacat ccaggagctc aacaggacc 240
aggagctaca acggattcag aaatgggtgg agacattccc aagtgcctgt cctcattggc 300
tatggggagg caaagttcgt gtccagctct atgaccctga ctatatgaag gtgattctgg 360
ggagatcaga cccgaaatcc catggttcct acagattcct ggctccatgg attgggtacg 420
gcttgctcct gttgaatgag cagacatggt tccagcatcg acggatgctg accccagcct 480
tccactatga catcctgaag ccctatgtgg ggctcatggc agactctgta cgagtgatgc 540
tggacaaatg ggaagagctc cttggccagg attcccctct ggaggtcttt cagcacgtct 600
ccttgatgac cctggacacc atcatgaagt gtgccttcag ccatcagggc agcatccagg 660
tggacaggaa ttctcagtcc tacatacagg ccattagtga cctgaacaac ctggtttttt 720
cccgtgtgag gaatgccttt caccagaatg acaccatcta cagcctgacc tctgctggcc 780
gctggacaca ccgcgcctgc cagctggccc atcagcacac agaccaagtg atccaactga 840
ggaaggctca actacagaag gagggggagc tggagaagat caagaggaag aggcatttgg 900
attttctgga tatcctcctc ttggccaaaa tggagaatgg gagcatcttg tcagacaagg 960
acctccgtgc tgaggtggac acgttcatgt ttgaggcca cgacaccaca gccagtggga 1020
tctcctggat cctctatgct ctggccacac accccaagca tcaggagagg tgcgggagg 1080
agatccacag cctcctgggt gatggagcct ccatcacctg gaaccacctg gaccagatgc 1140
cctacaccac catgtgcatt aaggaggcac tgaggctcta cccacccggtg ccaggcattg 1200
gcagagagct cagcactccc gtcaccttcc ctgatgggcg ctccttgccc aaaggtatca 1260
tggtcctcct ctccatttat ggccttcacc acaacccaaa agtgtggccc aacccagagg 1320
tgtttgaccc ttttccgtttt gcacgggtt ctgctcaaca cagccacgct ttcctgccct 1380
tctcaggagg atcaaggaac tgcattggga aacaatttgc catgaacgag ctgaaggtgg 1440
ccacggccct gaccctgctc cgctttgagc tgctgcctga tcccaccagg atccccatcc 1500
ccattgcacg acttgtgttg aaatccaaaa atggaatcca cctgcgtctc aggaggctcc 1560
```

```
ctaacccttg tgaagacaag gaccagcttt gagggcctcc acctgccgtc ctgtcttcct 1620
gacccccgct tctgtcccct tcctgtctgc ccatatcctg ttttctgtct gcccaccttc 1680
ccttcttccc acctgcctgc tgtcccccag tctgcctgcc cttctctctc tcacctttct 1740
ccaggctccc tacctgcttg tctacctgtc tcctacccac ctgtatctct tgttgggaga 1800
aaagctgagt gttgggagaa gctgaggccg agcttgcatg tctgacataa tgtaaaagag 1860
tcttgaatca tgtccaggat ccagggtcta aaaccccttg tggcctttgg aacaccaagc 1920
tctgtgctga agggtggaag gctaccctga cgcaccataa tctaagcccg gggcataaaa 1980
cccctcgtgg cttggataga atccagggct cgtggctctg gaatgtgtct ggacttgctg 2040
gctccttgct ccttgctctc ccaggatcaa ttgtatcttg agttaaaaga acctgctctc 2100
cattatctca agtaacagag cagatgctaa accgtcacag ctgtaaattg tgtgcttaat 2160
gcaacatgcc ctttcgaccc accccccatt ctcaccacct gtttcttgt ttgatcacca 2220
ataaataatc tgcacttcca gagctcgggg ccttcacagc ctccatcctt agctttggcg 2280
ccctggaccc actttctctc tcaaactgtc ttttctcact gctttgactc tgccggactt 2340
tgtcaccccc acgacctggt gttgggtctg aacacccaa catccctgaa tctccaccca 2400
cctcccaaac tcctgcctgc cctccagact gtctgcccat acacctgtct ccttcttcct 2460
gcctggcttg tctgttccta tattagtttc ctattactgc tgtaataaac tatcacaatc 2520
tcagtgattt taaataaaaa aaaaaaaaaa aaaaaaaaa aaaaaaacg gaattc        2576
```

```
<210> 35
<211> 1719
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. L27050

<400> 35
caaacacata caggaagcga tcaaacctac caaggcagtc tcacttctca atgactggac 60
tgtgtgggta ctctgctcca gacatgcgtg gcctcagact catcatgata ccagttgagc 120
tgctactttg ctacctcctg ctgcaccctg tggatgccac ttcatatgga aagcagacaa 180
atgtcttgat gcactttccc ttgtccttgg aatcccagac accctcctca gacccccttgt 240
cctgccaatt tctgcacccca aagtcactgc ctggtttcag ccacatggcc cctctaccca 300
agttcttggt aagcctggct ctaaggaatg ccctggagga agctggttgt caggctgatg 360
tttgggctct acagctacag ctctaccgcc agggtggtgt gaatgctaca caggtcctca 420
tccagcatct tcgagggctc cagaaaggca gaagcacaga gaggaacgtg tcagtggaag 480
ccctggcctc tgctctgcag ctgttagcca gggagcagca aagcacagga agggtcgggc 540
gctccctccc gacagaggac tgtgagaatg agaaggagca agctgtgcac aatgtagtcc 600
agctgctgcc aggagtggga accttctaca acctgggcac agctttgtat tatgctactc 660
aaaactgcct gggcaaggcc agggaacgag gccgagatgg ggccatagat ctgggatatg 720
accttctgat gaccatggct gggatgtcag gggggcctat gggtctagcg atcagtgctg 780
cacttaaacc tgcattaagg tctggggttc agcagttgat ccagtattac caagatcaga 840
aagacgcaaa catctctcag ccggagacca ccaaggaggg tttgagggcc atctcagatg 900
tgagtgactt ggaagaaaca actactctgg cttctttcat atcagaagta gtaagttcag 960
ctccctactg ggggtggggc ataatcaaga gctatgactt agatcctggg gctgggagtc 1020
ttgagatata aaagaatgtg gtaaccacag aattaataac tgtctaccct gacaagctat 1080
atacatgtct tcaaaatttt aatctgattt atccaggagg aaggctgtac agtaaaacgt 1140
aagaacgtaa atgtttgggt gttgataca cagggtttgg tttcgaatct aggctccact 1200
tgttagagcc tcggtgatca ctgaatagta acttctttct tgaactaaga tcagttttga 1260
agtttctaaa ggagatagaa tgattttaac ctcaatgagt tgccctgtaa atttaaaatg 1320
atacaatgaa tctaaaatgc ttatcacagt actttcaata aatagctatt agccaggtgc 1380
ggtggctcac gcctgtaatc ccagcactgt gagaggctga ggcgggatga tcacctgagg 1440
tcaggagttc aagatcagcc tgcgcaacat ggcgaaaccc cgtctctaca ataaatagca 1500
aaaaattatc ctggcggagt tatgcacgct tgtagtccca actacctggg aggctgaggc 1560
gggagaatca cctgagcctg ggaggctgag gcgggagaat cacctgagcc tgggaggtcg 1620
aggctgcagc gagccgagat cgcgccgctg cattccagcc tgggtgacag agcgagacca 1680
tgtctcaaaa aataaaaata aaaaaaaatt gttttcatt                        1719
```

```
<210> 36
<211> 1337
<212> DNA
<213> Homo sapiens
```

<220>
<223> Genbank Accession No. U37100

<400> 36
```
caaaaacagc aacagaaagc aggacgtgag acttctacct gctcactcag aatcatttct 60
gcaccaacca tggccacgtt tgtggagctc agtaccaaag ccaagatgcc cattgtgggc 120
ctgggcactt ggaagtctcc tctcggcaaa gtgaaagaag cagtgaaggt ggccattgat 180
gcaggatatc ggcacattga ctgtgcctat gtctatcaga atgaacatga agtggggggaa 240
gccatccaag agaagatcca agagaaggct gtgaagcggg aggacctgtt catcgtcagc 300
aagttgtggc ccactttctt tgagagaccc cttgtgagga aagcctttga gaagaccctc 360
aaggacctga agctgagcta tctggacgtc tatcttattc actggccaca gggattcaag 420
tctgggggatg accttttccc caaagatgat aaaggtaatg ccatcggtgg aaaagcaacg 480
ttcttggatg cctgggaggc catggaggag ctggtggatg aggggctggt gaaagccctt 540
ggggtctcca atttcagcca cttccagatc gagaagctct tgaacaaacc tggactgaaa 600
tataaaccag tgactaacca ggttgagtgt cacccatacc tcacgcagga gaaactgatc 660
cagtactgcc actccaaggg catcaccgtt acggcctaca gcccccctggg ctctccggat 720
agaccttggg ccaagccaga agacccttcc ctgctggagg atcccaagat taaggagatt 780
gctgcaaagc acaaaaaaac cgcagcccag gttctgatcc gtttccatat ccagaggaat 840
gtgattgtca tccccaagtc tgtgacacca gcacgcattg ttgagaacat tcaggtcttt 900
gactttaaat tgagtgatga ggagatggca accatactca gcttcaacag aaactggagg 960
gcctgtaacg tgttgcaatc ctctcatttg gaagactatc ccttcgatgc agaatattga 1020
ggttgaatct cctggtgaga ttatacagga gattctcttt cttcgctgaa gtgtgactac 1080
ctccactcat gtcccatttt agccaagctt atttaagatc acagtgaact tagtcctgtt 1140
atagacgaga atcgaggtgc tgttttagac atttatttct gtatgttcaa ctaggatcag 1200
aatatcacag aaaagcatgg cttgaataag gaaatgacaa ttttttccac ttatctgatc 1260
agaacaaatg tttattaagc atcagaaact ctgccaacac tgaggatgta aagatcaata 1320
aaaaaaataa taatcat                                                 1337
```

<210> 37
<211> 1517
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. U02390

<400> 37
```
attctttggg gaggcaacta ggatggtgtg gccgaccacg gatttgcatt gccgaggacg 60
ggacccccagg gcagcgaagc agaatggcca acatgcaggg actggtggaa agactggaac 120
gagctgtcag ccgcctggag tcgctgtctg cagagtccca caggcccccct gggaactgcg 180
gggaagtcaa tggtgtcatt gcaggtgtgg caccctccgt ggaagccttt gacaagctga 240
tggacagtat ggtggccgag tttttaaaga acagtaggat ccttgctggg gacgtggaga 300
cccatgcaga aatggtgcac agtgctttcc aggcccagcg ggctttcctt ctgatggcct 360
ctcagtacca acaaccccac gagaatgacg tggccgcact tctgaaaccc atatcggaaa 420
agattcagga aatccaaact ttcagagaga gaaaccgggg gagtaacatg tttaatcatc 480
tttcggccgt cagcgaaagc atccctgccc ttggatggat agctgtgtct cccaaacctg 540
gtccttatgt caaggagatg aatgacgctg ccaccttta cactaacagg gtcttaaagg 600
actacaaaca cagtgatttg cgtcatgtgg attgggtgaa gtcatatttg aacatttgga 660
gtgaacttca agcatacatc aaggaacacc acaccacggg cctcacatgg agcaaaacag 720
gtcctgtagc atccacagta tcagcgtttt ctgtcctctc ctctgggcct ggccttcctc 780
cacccctcc tcctctgcct cctccagggc cacctccact tttcgagaat gaaggcaaaa 840
aagaggaatc ttctccttca cgctcagctt tatttgccca acttaaccag ggagaagcaa 900
ttacaaaagg gctccgccat gtcacagatg accagaagac atacaaaaat cccagcctgc 960
gggctcaagg aggggcaaact caatctccca ccaaaagtca cactccaagt cccacatctc 1020
ctaaatctta tccttctcaa aaacatgccc cagtgttgga gttggaagga aagaaatgga 1080
gagtggagta ccaagaggac aggaatgacc ttgtgatttc agagactgag ctgaaacaag 1140
tggcttacat tttcaaatgc gaaaaatcaa ctattcagat aaaaggggaaa gtaaactcca 1200
ttataattga caactgtaag aaactcggcc tggtgtttga caatgtggtg ggcattgtgg 1260
aagtgatcaa ctcccaggac attcaaatcc aggtaatggg gagagtgcca acaatttcca 1320
ttaataagac agaaggttgc cacatatacc tcagtgaaga tgcattagac tgtgagatcg 1380
```

```
tgagcgccaa gtcatctgaa atgaacatac ttatccctca ggatggtgat tatagagaat 1440
ttcccattcc tgaacagttc aagacagcat gggatggatc caagttaatc actgaacctg 1500
cagaaattat ggcctaa                                                 1517
```

<210> 38
<211> 536
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AW006831

<400> 38
```
tttttctgga attctttttt ttttttttt ttttgaggat tttgtgtggc taatgtgttc 60
tagaagcaga gactccaggg agaaccagaa tttatgaagc ctcgtgcaac atggtgcttt 120
ctcaccgagg tcatatgcct ggctgctgct gttccactca gctccatgag ccacgtttgt 180
tattttatgt ttcttctgtg cttttgctca tttccacccca tgtgtttata gacctttttt 240
cagccctttt tctttgttcc tttccctcat cttttttgcct caggtagaat ccatcagttt 300
tcctccccct ccaaatgact gtgtacctcc agctgctcag gactttggag gtggggggcgg 360
ggcctgggga tctacccttc taaaaaactc tccaagtaat tctgatacca ataaagtggg 420
agacctccat ttttgaggcc tatttgcaag catgtctccc tcccttttcca tggctttttc 480
gtttctcgca tgttccactg ctttgcactg tctagacagg aaacctagga agatgt      536
```

<210> 39
<211> 2194
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. U90441

<400> 39
```
ggggaaggaa cactgtaggg gatagctgtc cacggacgct gtctacaaga ccctggagtg 60
agataacgtg cctggtactg tgccctgcat gtgtaagatg cccagttgac cttcgcagca 120
ggagcctgga tcaggcactt cctgcctcag gtattgctgg acagcccaga cacttccctc 180
tgtgaccatg aaactctggg tgtctgcatt gctgatggcc tggtttggtg tcctgagctg 240
tgtgcaggcc gaattcttca cctctattgg gcacatgact gacctgattt atgcagagaa 300
agagctggtg cagtctctga aagagtacat ccttgtggag gaagccaagc tttccaagat 360
taagagctgg gccaacaaaa tggaagcctt gactagcaag tcagctgctg atgctgaggg 420
ctacctggct caccctgtga atgcctacaa actggtgaag cggctaaaca cagactggcc 480
tgcgctggag gaccttgtcc tgcaggactc agctgcaggt tttatcgcca acctctctgt 540
gcagcggcag ttcttcccca ctgatgagga cgagatagga gctgccaaag ccctgatgag 600
acttcaggac acatacaggc tggacccagg cacaatttcc agagggggaac ttccaggaac 660
caagtaccag gcaatgctga gtgtggatga ctgctttggg atgggccaagc cggcctacaa 720
tgaaggggac tattatcata cggtgttgtg gatggagcag gtgctaaagc agcttgatgc 780
cggggaggag gccaccacaa ccaagtcaca ggtgctggac tacctcagct atgctgtctt 840
ccagttgggt gatctgcacc gtgccctgga gctcacccgc cgcctgctct cccttgaccc 900
aagccacgaa cgagctggag ggaatctgcg gtactttgag cagttattgg aggaagagag 960
agaaaaaacg ttaacaaatc agacagaagc tgagctagca accccagaag gcatctatga 1020
gaggcctgtg gactacctgc ctgagaggga tgtttacgag agcctctgtc gtggggaggg 1080
tgtcaaactg acaccccgta gacagaagag gcttttctgt aggtaccacc atggcaacag 1140
ggccccacag ctgctcattg cccccttcaa agaggaggac gagtgggaca gcccgcacat 1200
cgtcaggtac tacgatgtca tgtctgatga ggaaatcgag aggatcaagg agatcgcaaa 1260
acctaaactt gcacgagcca ccgttcgtga tcccaagaca ggagtcctca ctgtcgccag 1320
ctaccgggtt tccaaaagct cctggctaga ggaagatgat gaccctgttg tggcccgagt 1380
aaatcgtcgg atgcagcata tcacagggtt aacagtaaag actgcagaat tgttacaggt 1440
tgcaaattat ggagtgggag acagtatga accgcacttc gacttctcta ggaatgatga 1500
gcgagatact ttcaagcatt tagggacggg gaatcgtgtg gctactttct taaactacat 1560
gagtgatgta gaagctggtg gtgccaccgt cttccctgat ctggggggctg caatttggcc 1620
taagaagggt acagctgtgt tctggtacaa cctcttgcgg agcggggaag gtgactaccg 1680
aacaagacat gctgcctgcc ctgtgcttgt gggctgcaag tgggtctcca ataagtggtt 1740
```

```
ccatgaacga ggacaggagt tcttgagacc ttgtggatca acagaagttg actgacatcc 1800
ttttctgtcc ttccccttcc tggtccttca gcccatgtca acgtgacaga cacctttgta 1860
tgttccttgt atgttcctat caggctgatt tttggagaaa tgaatgtttg tctggagcag 1920
agggagacca tactagggcg actcctgtgt gactgaagtc ccagcccttc cattcagcct 1980
gtgccatccc tggccccaag gctaggatca aagtggctgc agcagagtta gctgtctagc 2040
gcctagcaag gtgcctttgt acctcaggtg ttttaggtgt gagatgtttc agtgaaccaa 2100
agttctgata ccttgtttac atgtttgttt ttatggcatt tctatctatt gtggctttac 2160
caaaaaataa aatgtcccta ccagaagcct taaa                                2194
```

<210> 40
<211> 1324
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. D43642

<400> 40
```
ctggtgaggg gctgcaggtg gcggcgcagt ctcggtaggc ggtatgagtt tggctggggg 60
ccgggcaccc cggaagaccg ctgggaaccg gctttctggg cttttggagg cagaggagga 120
agatgagttc taccagacga cttatggggg tttcacagag gaatccggag atgatgagta 180
tcaaggggac cagtcagaca cagaggacga agtggactct gactttgaca ttgatgaagg 240
ggatgaacca tccagtgatg gagaagcaga agagccaaga aggaagcgcc gagtagtcac 300
caaggcctat aaggaacctc tcaagagctt aaggcctcga aaggtcaaca ccccggctgg 360
tagctctcag aaggcgcgag aagagaaggc actactgcca ttagaactac aagatgacgg 420
ctctgacagt cggaagtcta tgcgtcagtc tacagctgag catacacgac aaacgttcct 480
tcgggtacag gagaggcagg gccagtcaag acggcgaaag gggcccccact gtgagcggcc 540
actaacccag gaggaactgc tccgggaggc caagatcaca gaagagctta atttacggtc 600
actggagaca tatgagcggc tcgaggctga taaaaagaag caggttcata agaagcggaa 660
gtgccccggg cccataatca cctatcattc agtgacagtg ccacttgttg gggagccagg 720
ccccaaggaa gagaacgttg acatagaagg acttgatcct gctccctcgg tgtctgcatt 780
gactcctcat gctgggactg gacccgtcaa ccccccctgct cgctgctcac gtaccttcat 840
cactttttagt gatgatgcaa ctttcgagga atggttcccc caagggcggc ccccaaaagt 900
ccctgttcgt gaggtctgtc cagtgaccca tcgtccagcc ctataccggg accctgttac 960
agacataccc tatgccactg ctcgagcctt caagatcatt cgtgaggctt acaagaagta 1020
cattactgcc catggactgc cgcccactgc ctcagccctg ggccccggcc cgccacctcc 1080
tgagcccctc cctggctctg ggccccgagc cttgcgccag aaaattgtca ttaaatgaag 1140
agatgtctag tcctcagaaa cttctttcct gccctgattg gggctcttgc tgttccgttt 1200
cttctccctg cttctcccct ttgtcatctc tgatctttgc ctaatctgtt tcttttttcct 1260
tttcccctag ttcttacagg tttcgttgtg ttttttaatc taataaaata gaaagatccc 1320
tttt                                                                1324
```

<210> 41
<211> 890
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. M91670

<400> 41
```
ggcggaccga agaacgcagg aagggggccg gggggacccg ccccecggccg gccgcagcca 60
tgaactccaa cgtggagaac ctaccccegc acatcatccg cctggtgtac aaggaggtga 120
cgacactgac cgcagaccca cccgatggca tcaaggtctt tcccaacgag gaggacctca 180
ccgacctcca ggtcaccatc gagggccctg aggggacccc acccaagggc tacttcctga 240
gcatgaaact cctgctgggg aaggacttcc ctgccgagat ctgcgtcaac gtgctcaaga 300
ccaagatctt ccaccegaac gtgggcgcca atggcgagat ctgcgtcaac gtgctcaaga 360
gggactggac ggctgagctg ggcatccgac acgtactgct gaccatcaag tgcctgctga 420
tccaccctaa ccccgagtct gcactcaacg aggaggcggg ccgcctgctc ttggagaact 480
acgaggagta tgcggctcgg gcccgtctgc tcacagagat ccacggggc gccggcgggc 540
ccagcggcag ggccgaagcc ggtcgggccc tggccagtgg cactgaagct tcctccaccg 600
```

```
acccctgggggc cccagggggc ccgggagggg ctgagggtcc catggccaag aagcatgctg 660
gcgagcgcga taagaagctg gcggccaaga aaaagacgga caagaagcgg gcgctgcggg 720
cgctgcggcg gctgtagtgg gctctcttcc tccttccacc gtgaccccaa cctctcctgt 780
cccctccctc caactctgtc tctaagttat ttaaattatg gctggggtcg gggagggtac 840
aggggggcact gggacctgga tttgttttttc taaataaagt tggaaaagca         890
```

<210> 42
<211> 457
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI478190

<220>
<221> unsure
<222> (1)..(457)
<223> n = a or c or g or t

<400> 42
```
tttttttttt tttttttttt tttttttttt tggggattta tatgactttt attttaatat 60
cattttaata tcgaatatgt cacaagattt aatgaccaaa ttagtcattt acattttttca 120
aagtatctaa atataaaatt gctaaaaatt caaatacaga tagcaagcta caaatatttc 180
ttttgttttt gggggggggg taggaatgga agacattaaa aaaggacgct cctgttggct 240
gaacaaagat cagaatgaaa gaagaattca tcagcntgac cccttgtgca aagaaataca 300
ctcagctttta agatgctgtt ttagacacat ctcttcctgt acaacaattt aaaaaatgtt 360
tctaatgcag gtcctcagtg aaacacccct ctccctgaaa cgtgagaaac agcagctttc 420
cgcctgcttg aaaaaggagg caggcgctgt aaggaga                         457
```

<210> 43
<211> 1330
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. U51007

<400> 43
```
aattcccaaa tgacctttta tttcatacag agatacaaag gcaactatgt gcagcaacaa 60
tctgatgggc agtccaaact cttgggagga agtaaattca tggtaaatgt catgatggcg 120
gtcgggaggg aggaaggtgg caagatggtg ttggaaagca ctatggtgtg tgtggacaac 180
agtgagtata tgcggaatgg agacttctta cccaccaggc tgcaggccca gcaggatgct 240
gtcaacatag tttgtcattc aaagacccgc agcaaccctg agaacaacgt gggccttatc 300
acactggcta atgactgtga agtgctgacc acactcaccc cagacactgg ccgtatcctg 360
tccaagctac atactgtcca acccaagggc aagatcacct tctgcacggg catccgcgtg 420
gcccatctgg ctctgaagca ccgacaaggc aagaatcaca agatgcgcat cattgccttt 480
gtgggaagcc cagtggagga caatgagaag gatctggtga aactggctaa acgcctcaag 540
aaggagaaag taaatgttga cattatcaat tttgggggaag aggaggtgaa cacagaaaag 600
ctgacagcct ttgtaaacac gttgaatggc aaagatggaa ccggttctca tctggtgaca 660
gtgcctcctg ggcccagttt ggctgatgct ctcatcagtt ctccgatttt ggctggtgaa 720
ggtggtgcca tgctgggtct tggtgccagt gactttgaat ttggagtaga tcccagtgct 780
gatcctgagc tggccttggc ccttcgtgta tctatggaag agcagcggca gcggcaggag 840
gaggaggccc ggcgggcagc tgcagcttct gctgctgagg ccgggcagcaaga gtttggccgc 900
actgaagact cagacgatgc cctgctgaag atgaccatca gccagcaaga gtttggccgc 960
actgggcttc ctgacctaag cagtatgact gaggaagagc agattgctta tgccatgcag 1020
atgtccctgc agggagcaga gtttggccag gcggaatcag cagacattga tgccagctca 1080
gctatggaca catccgagcc agccaaggag gaggatgatt acgacgtgat gcaggacccc 1140
gagttccttc agagtgtcct agagaacctc ccaggtgtgg atcccaacaa tgaagccatt 1200
cgaaatgcta tgggctccct ggcctcccag gccaccaagg acggcaagaa ggacaagaag 1260
gaggaagaca agaagtgaga ctggagggaa agggtagctg agtctgctta gggactgcat 1320
ggggggaattc                                                      1330
```

<210> 44
<211> 776
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI953020

<220>
<221> unsure
<222> (1)..(776)
<223> n = a or c or g or t

<400> 44
```
gcggccgcca tctcgccgtc gtcccgcggg gtgcccgggg cgttgctcag gccggccacg 60
gcgccggggg aactcttcgg caacccgtcc atgtcgcccg agcccaggga tccgttcacg 120
tggtgaggct ccatcgcgct catggcggcc atggggccct ccgggccagg gccgagcggg 180
aaattagccc tgccggcgcc ctgcccgatg gggttcatga tagtgtacat gttttcgctg 240
gagttggtgg aatctccagg gctaggcatg atgggtgttc caggggggccc acctcctcct 300
gggggtccgg tgtagctgcc gggggatgag gaggagtagg ggatcgagtt tccactgggg 360
ctggcccacg ggccacgaac tcctgggccc atgttcatgg caggcaggcc tgggccggcg 420
agggagttgg gtgggggtcg catgccacct ccatagctct ggggccccac gctggccatg 480
ccacgaggag gcgtcaccct ctgcattgng ccgcccatgc tcggatgccc ctgggctcgt 540
ggggagggct ccatggcgcc agggaggagg ggctggggag ccaggaggcc tgcgggaggc 600
tgacnntcgc atccgcaggg tggccgnang cccnctgnga agcgcggtga catgaagggg 660
ctgggagagc cangccgcat ggagcctgcn gncattgtgt cacctggggc catactccnc 720
ataaccgggg ctgnggcggc tgcagcacta tagtnctgga aggncntggn ctcngc     776
```

<210> 45
<211> 476
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI971969

<400> 45
```
ttttttttt gagctgactc tgtcccttta atgcccaggc tgagcccagt gcctccttga 60
gtatctgctc catcactggc gacgccacag gtaggtgtga atggagtagc caggtgagat 120
tgtctccagg aagcccacag caggatcctt gatggtaaga ggcacatcct tagaggagcg 180
gtttagcacg accacaacag cagagccatc gggatgcatc agtgccactg cgtccaggtc 240
gttcttctga ctggcaacca gccccactct ctgggagccc tcaggaatga acttgctgaa 300
gtggccaagg tggtagaaca tgggctgttt gtaaacgtg tccttggtga tgtctacaat 360
gatgggactg tcgacaaagt tacgcacccca attgggtcct ccttcggggt tcaggcaag 420
gttccagtcg gtccagccga ccacatggta caggaggttt gttgatgaat gctgtg     476
```

<210> 46
<211> 2745
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AF046889

<400> 46
```
acaatcctcg ccttgtctgt ggcgccggca tctggagctt tctgtagcct ccggatacgc 60
cttttttttca gggcgtagcc cctagccaag ctgctccccg cggcggccgc acagcagccc 120
gagcgccccc tttccagagc tcccctccgg agctgggatc caggcgcgta gcggagatcc 180
caggatcctg ggtgctgttt gggcccgctc cccaccatga cctcctcggg gcctggaccc 240
cggttcctgc tgctgctgcc gctgctgctg cccctgcgg cctcagcctc cgaccggccc 300
```

```
cggggccgag accccggtcaa cccagagaag ctgctggtga tcactgtggc cacagctgaa  360
accgaggggt acctgcgttt cctgcgctct gcggagttct tcaactacac tgtgcggacc  420
ctgggcctgg gagaggagtg gcgagggggt gatgtggctc gaacagttgg tggaggacag  480
aaggtccggt ggttaaagaa ggaaatggag aaatacgctg accgggagga tatgatcatc  540
atgtttgtgg atagctacga cgtgattctg gccggcagcc ccacagagct gctgaagaag  600
ttcgtccaga gtggcagccg cctgctcttc tctgcagaga gcttctgctg gcccgagtgg  660
gggctggcgg agcagtaccc tgaggtgggc acggggaagc gcttcctcaa ttctggtgga  720
ttcatcggtt ttgccaccac catccaccaa atcgtgcgcc agtggaagta caaggatgat  780
gacgacgacc agctgttcta cacacggctc tacctggacc caggactgag ggagaaactc  840
agccttaatc tggatcataa gtctcggatc tttcagaacc tcaacggggc tttagatgaa  900
gtggttttaa agtttgatcg gaaccgtgtg cgtatccgga acgtggccta cgacacgctc  960
cccattgtgg tccatggaaa cggtcccact aagctgcagc tcaactacct gggaaactac 1020
gtccccaatg gctggactcc tgagggaggc tgtggcttct gcaaccagga ccggaggaca 1080
/ctcccggggg ggcagcctcc ccccgggtg tttctggccg tgtttgtgga acagcctact 1140
ccgtttctgc cccgcttcct gcagcggctg ctactcctgg actatcccc cgacagggtc 1200
accctttttcc tgcacaacaa cgaggtcttc catgaacccc acatcgctga ctcctggccg 1260
cagctccagg accacttctc agctgtgaag ctcgtggggc cggaggaggc tctgagccca 1320
ggcgaggcca gggacatggc catggacctg tgtcggcagg accccgagtg tgagttctac 1380
ttcagcctgg acgccgacgc tgtcctcacc aacctgcaga ccctgcgtat cctcattgag 1440
gagaacagga aggtgatcgc ccccatgctg tcccgccacg gcaagctgtg gtccaacttc 1500
tggggcgccc tgagccccga tgagtactac gcccgctccg aggactacgt ggagctggtg 1560
cagcggaagc gagtgggtgt gtggaatgta ccatacatct cccaggccta tgtgatccgg 1620
ggtgataccc tgcggatgga gctgccccag agggatgtgt tctcgggcag tgacacagac 1680
ccggacatgg ccttctgtaa gagctttcga gacaagggca tcttcctcca tctgagcaat 1740
cagcatgaat ttggccggct cctggccact tccagatacg acacggagca cctgcacccc 1800
gacctctggc agatcttcga caaccccgtc gactggaagg agcagtacat ccacgagaac 1860
tacagccggg ccctggaagg ggaaggaatc gtggagcagc catgcccgga cgtgtactgg 1920
ttcccactgc tgtcagaaca aatgtgtgat gagctggtgg cagagatgga gcactacggc 1980
cagtggtcag gcggccggca tgaggattca aggctggctg gaggctacga gaatgtgccc 2040
accgtggaca tccacatgaa gcaggtgggg tacgaggacc agtggctgca gctgctgcgg 2100
acgtatgtgg gccccatgac cgagagcctg tttcccggtt accacaccaa ggcgcggggcg 2160
gtgatgaact ttgtggttcg ctaccggcca gacgagcagc cgtctctgcg gccacaccac 2220
gactcatcca ccttcaccct caacgttgcc ctcaaccaca agggcctgga ctatgaggga 2280
ggtggctgcc gcttcctgcg ctacgactgt gtgatctcct ccccgaggaa gggctgggca 2340
ctcctgcacc ccggccgcct cacccactac cacgaggggc tgccaacgac ctggggcaca 2400
cgctacatca tggtgtcctt tgtcgacccc tgacactcaa ccactctgcc aaacctgccc 2460
tgccattgtg cctttttagg gggcctggcc cccgtcctgg gagttggggg atgggtctct 2520
ctgtctcccc acttcctgag ttcatgttcc gcgtgcctga actgaatatg tcaccttgct 2580
cccaagacac ggccctctca ggaagctccc ggagtccccg cctctctcct ccgcccacag 2640
gggttcgtgg gcacagggct tctggggact ccccgcgtga taaattatta atgttccgca 2700
gtctcactct gaataaagga cagtttgtaa atcttaaaaa aaaaa              2745
```

```
<210> 47
<211> 524
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI937030

<220>
<221> unsure
<222> (1)..(524)
<223> n = a or c or g or t

<400> 47
ggaagggacc actgccttta ttgcctctgt gctggggtcc cagcctgggg ttcagaggcc   60
tctgggggca ataggtgacc ctggacccaa attattgcta cttggccagg tcaccttggg  120
gcttcccata ctgccctgag aatgggtggg atgagggcat gcaaacgata tgcaaatgac  180
atgcaaacca acccagaggc ctctggcaca tccatgggtg ctggaagagt caaagcctan  240
tggcctggga gggcgacggg gcacccagct caggcccagc ctcggaggca aggtttgagg  300
```

```
gttggggggt ccctgagcat cagccctgct tctgccgctg gctgaggagg agcagaagcc 360
tggtcccaag acagcaggaa gaaagcagga ccctcgctag gcggccagat ggcctgaggc 420
ccacccagac agggacggga cctgccctgn gtcgctcagc caggcaggga cagcagggac 480
cagaatccag gtctcctgag ccaggcagaa gccaaagtag cttg          524
```

```
<210> 48
<211> 571
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI829890

<220>
<221> unsure
<222> (1)..(571)
<223> n = a or c or g or t

<400> 48
ttttttttaac aggaaaaaat tatttaatag tataacaaaa tgcgaaataa agtacccaag 60
ttacaaaaca taaattcctt tggttcatga tcacaccact atttttacct tccacatagc 120
tacagacatc acaccctcaa agtgaagtca aactgtcccc ctcatactga agatgtcatg 180
ccaaaaccat cacatacccc actgttcagt gaaactgttg gcaacttaca tggaacagag 240
ctgtggggta ggaaaaaggg gaaagggttg cgttaaaaaa aatggggaga ctctacacat 300
gcanaacaag ttagtgggag ggagtgctct gctgggtcaa cacgccatga accacacccc 360
tattcgtgct acatgaggct gagtccttgc tacaaccaca cagaaataca gacaatcaag 420
tgaacctgag caccccccagg gataacagaa gaaaaataca gagaagcaga ggagagaaag 480
aatggcagca agaggcagat cacagaatac cagggaacac ctagtccaaa ccctgtttta 540
cagatgggga aagtgagacc tggagtagtg a          571
```

```
<210> 49
<211> 1204
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. D17793

<400> 49
ctctgaggag aagcagcagc aaacatttgc tagtcagaca agtgacaggg aatggattcc 60
aaacagcagt gtgtaaagct aaatgatggc cacttcatgc ctgtattggg atttggcacc 120
tatgcacctc cagaggttcc gagaagtaaa gctttggagg tcacaaaatt agcaatagaa 180
gctgggttcc gccatataga ttctgctcat ttatacaata atgaggagca ggttggactg 240
gccatccgaa gcaagattgc agatggcagt gtgaagagag aagacatatt ctacacttca 300
aagctttggt ccacttttca tcgaccagag ttggtccgac cagccttgga aaactcactg 360
aaaaaagctc aattggacta tgttgacctc tatcttattc attctccaat gtctctaaag 420
ccaggtgagg aactttcacc aacagatgaa aatggaaaag taatatttga catagtggat 480
ctctgtacca cctgggaggc catggagaag tgtaaggatg caggattggc caagtccatt 540
ggggtgtcaa acttcaaccg caggcagctg gagatgatcc tcaacaagcc aggactcaag 600
tacaagcctg tctgcaacca ggtagaatgt catccgtatt tcaaccggag taaattgcta 660
gatttctgca agtcgaaaga tattgttctg gttgcctata gtgctctggg atctcaacga 720
gacaaacgat gggtggaccc gaactccccg gtgctcttgg aggacccagt cctttgtgcc 780
ttggcaaaaa agcacaagcg aaccccagcc ctgattgccc tgcgctacca gctgcagcgt 840
ggggttgtgg tcctggccaa gagctacaat gagcagcgca tcagacagaa cgtgcaggtt 900
tttgagttcc agttgactgc agaggacatg aaagccatag atggcctaga cagaaatctc 960
cactatttta acagtgatag ttttgctagc caccctaatt atccatattc agatgaatat 1020
taacatggag agctttgcct gatgtctacc agaagccctg tgtgtggatg gtgacgcaga 1080
ggacgtctct atgccggtga ctggacatat cacctctact taaatccgtc ctgtttagcg 1140
acttcagtca actacagctg agtccatagg ccagaaagac aataaatttt tatcattttg 1200
aaat          1204
```

```
<210> 50
<211> 2436
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. X62078

<400> 50
aaggcacctc tgccgccaca gaccttgcag ttaactccgc cctgacccac ccttcccgat 60
gcagtccctg atgcaggctc ccctcctgat cgccctgggc ttgcttctcg cgacccctgc 120
gcaagcccac ctgaaaaagc catcccagct cagtagcttt tcctgggata actgtgatga 180
agggaaggac cctgcggtga tcagaagcct gactctggag cctgacccca tcgtcgttcc 240
tggaaatgtg accctcagtg tcgtgggcag caccagtgtc ccctgagtt ctcctctgaa 300
ggtggattta gttttggaga aggaggtggc tggcctctgg atcaagatcc catgcacaga 360
ctacattggc agctgtacct ttgaacactt ctgtgatgtg cttgacatgt taattcctac 420
tggggagccc tgcccagagc ccctgcgtac ctatgggctt ccttgccact gtcccttcaa 480
agaaggaacc tactcactgc ccaagagcga attcgttgtg cctgacctgg agctgcccag 540
ttggctcacc accgggaact accgcataga gagcgtcctg agcagcagtg ggaagcgtct 600
gggctgcatc aagatcgctg cctctctaaa gggcatataa catggcatct gccacagcag 660
aatggagcgg tgtgaggaag gtccctttt ctctgttttg tgtttgccaa ggccaaactc 720
ccactctctg cccccctta atccccttt tacagtgagt ccactaccct cactgaaat 780
cattttgtac cacttacatt ttaggctggg gcaagcagcc ctgacctaag ggagaatgag 840
ttggacagtt cttgatagcc cagggcatct gctgggctga ccacgttact catccccgtt 900
aacattctct ctaaagagcc tcgttcattt ccaaagcagt taaggaatgg gaaccagagt 960
gttttaggac ctgaagaatc tttatgactc tctctctttc actctttttt tttttgtca 1020
ctaagttaaa agcgaagtga gagtattaac gttttttgttc tcctccggcc ccctgttaca 1080
atgaaggggc aaaagtattt gctcttagtc tattcctccc ttaacttctg tgactaattt 1140
ttatttcctt tctagatttg cccaattaat actaggtgc agtgtatcct ggagaggtag 1200
ggtgtgtggg ggaggaatcc cttgggggag atattaggag tgctctgttg tttacaaact 1260
cacggtaccc gcagggccta gcaagagact taaatgactg ataagaaccg tgagaaacat 1320
gttgcttcca ggcttgattt cgatttttcg cttttttttt ttttgagaca gaatctcact 1380
ttgtcaccag gctggagtgc agtggtgcaa tctcacctca ctgcaacctc cgcctcctgg 1440
gttcaagcaa ttctcctgcc tcagcctccc aagtagcttg gactacaggc cctgccacca 1500
cgcccggcta atttgtgtat ttttagtaga gatggggttt caccatgttg gccaggatgg 1560
tctcgatctc ttgacctcgt gatctgtcca ccttggcctt gcaaagcgct ggattacagg 1620
catgagccac tacacccagc cgattttcc ttttgatta aagatgctat tacaatgtaa 1680
atatttctta cacagaaagt cacagcacat gtgcccattg atacaaggct gctgaggcct 1740
ggtctccagt tggaaatata attaagggtg gcaaggactg gagtcagttg gagagtgcat 1800
agccagtctg tgaagacaac tgccagatac tggcaatact ccagcctggt gacagagtga 1860
gactctgtct caaaaaaaa gtttcaatgt ttactcctag agaagccaaa aatccagatt 1920
tgtatatgaa atcttaccat tttaaagat tggcagctaa ttattttttt aaaagctgt 1980
gcagtgtgat gtgtcccaaa cggactggct catgggtggc cacgtcacaa cctctgatct 2040
cagaccgtgc atgccttgtc ctcttaagac aactcctgtg gcaccgtttc tccctccaca 2100
gggccaaagc catagtgtcc ggtcccaagg acaaggctct tccagtgcta ggagaggtat 2160
gagcagcctc tcacctgtga gctgtgggga tcacaaggct gcctgcctca gtcttggagt 2220
cctgttgggt gaatgaggca gatgggaaag agcctcacca gcagctgctt ttggagcagg 2280
ggtccaagga agagagggtg gcctcgacat caaactgcct ggattttct accaccctgt 2340
tacatcataa caacttctga aacacacacc agccctgagt ctgggctca tttgaagcct 2400
ggaatagcaa taaatctttt taacttgcgg acagtt                          2436


<210> 51
<211> 3590
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. L76191

<400> 51
cgcggacccg gccggcccag gcccgcgccc gccgcggccc tgagaggccc cggcaggtcc 60
```

```
cggcccggcg gcggcagcca tggccggggg gccgggcccg ggggagcccg cagcccccgg 120
cgcccagcac ttcttgtacg aggtgccgcc ctgggtcatg tgccgcttct acaaagtgat 180
ggacgccctg gagcccgccg actggtgcca gttcgccgcc ctgatcgtgc gcgaccagac 240
cgagctgcgg ctgtgcgagc gctccgggca gcgcacggcc agcgtcctgt ggccctggat 300
caaccgcaac gcccgtgtgg ccgacctcgt gcacatcctc acgcacctgc agctgctccg 360
tgcgcgggac atcatcacag cctggcaccc tcccgccccg cttccgtccc caggcaccac 420
tgccccgagg cccagcagca tccctgcacc cgccgaggcc gaggcctgga gcccccggaa 480
gttgccatcc tcagcctcca ccttcctctc cccagctttt ccaggctccc agacccattc 540
agggcctgag ctcggcctgg ttccaagccc tgcttccctg tggcctccac cgccatctcc 600
agccccttct tctaccaagc caggcccaga gagctcagtg tccctcctgc agggagcccg 660
cccctctccg ttttgctggc ccctctgtga gatttcccgg ggcacccaca acttctcgga 720
ggagctcaag atcgggggagg gtggctttgg gtgcgtgtac cgggcggtga tgaggaacac 780
ggtgtatgct gtgaagaggc tgaaggagaa cgctgacctg gagtggactg cagtgaagca 840
gagcttcctg accgaggtgg agcagctgtc caggtttcgt cacccaaaca ttgtggactt 900
tgctggctac tgtgctcaga acggcttcta ctgcctggtg tacggcttcc tgcccaacgg 960
ctccctggag gaccgtctcc actgccagac ccaggcctgc ccacctctct cctggcctca 1020
gcgactggac atccttctgg gtacagcccg ggcaattcag tttctacatc aggacagccc 1080
cagcctcatc catggagaca tcaagagttc caacgtcctt ctggatgaga ggctgacacc 1140
caagctggga gactttggcc tggcccggtt cagccgcttt gccgggtcca gccccagcca 1200
gagcagcatg gtggcccgga cacagacagt gcggggcacc ctggcctacc tgcccgagga 1260
gtacatcaag acgggaaggc tggctgtgga cacgacacc ttcagctttg gggtggtagt 1320
gctagagacc ttggctggtc agagggctgt gaagacgcac ggtgccagga ccaagtatct 1380
gaaagacctg gtggaagagg aggctgagga ggctggagtg gctttgagaa gcacccagag 1440
cacactgcaa gcaggtctgg ctgcagatgc ctgggctgct cccatcgcca tgcagatcta 1500
caagaagcac ctggacccca ggcccgggcc ctgcccacct gagctgggcc tgggcctggg 1560
ccagctggcc tgctgctgcc tgcaccgccg ggccaaaagg aggcctccta tgacccaggt 1620
gtacgagagg ctagagaagc tgcaggcagt ggtggcgggg gtgcccgggc atttggaggc 1680
cgccagctgc atccccccctt ccccgcagga gaactcctac gtgtccagca ctggcagagc 1740
ccacagtggg gctgctccat ggcagcccct ggcagcgcca tcaggagcca gtgcccaggc 1800
agcagagcag ctgcagagag gccccaacca gcccgtggag agtgacgaga gcctaggcgg 1860
cctctctgct gccctgcgct cctggcactt gactccaagc tgccctctgg acccagcacc 1920
cctcagggag gccggctgtc ctcaggggga cacggcagga gaatcgagct gggggagtgg 1980
cccaggatcc cggcccacag ccgtggaagg actggccctt ggcagctctg catcatcgtc 2040
gtcagagcca ccgcagatta tcatcaaccc tgcccgacag aagatggtcc agaagctggc 2100
cctgtacgag gatgggggccc tggacagcct gcagctgctg tcgtccagct ccctcccagg 2160
cttgggcctg gaacaggaca ggcaggggcc cgaagaaagt gatgaatttc agagctgatg 2220
tgttcacctg ggcagatccc ccaaatccgg aagtcaaagt tctcatggtc agaagttctc 2280
atggtgcacg agtcctcagc actctgccgg cagtgggggt gggggcccat gcccgcgggg 2340
gagagaagga ggtggccctg ctgttctagg ctctgtgggc ataggcaggc agagtggaac 2400
cctgcctcca tgccagcatc tggggggcaag gaaggctggc atcatccagt gaggaggctg 2460
gcgcatgttg ggaggctgct ggctgcacag acccgtgagg ggaggagagg ggctgctgtg 2520
caggggtgtg gagtagggag ctggctcccc tgagagccat gcagggcgtc tgcagcccag 2580
gcctctggca gcagctcttt gcccatctct ttggacagtg gccaccctgc acaatggggc 2640
cgacgaggcc tagggccctc ctacctgctt acaatttgga aaaagtgtggc cgggtgcggt 2700
ggctcacgcc tgtaatccca gcactttggg aggccaaggc aggaggatcg ctggagccca 2760
gtaggtcaag accagccagg gcaacatgat gagaccctgt ctctgccaaa aaattttta 2820
aactattagc ctggcgtggt agcgcacgcc tgtggtccca gctgctgggg aggctgaagt 2880
aggaggatca tttatgcttg ggaggtcgag gctgcagtga gtcatgattg tatgactgca 2940
ctccagcctg ggtgacagag caagaccctg tttcaaaaag aaaaacctg ggaaaagtga 3000
agtatggctg taagtctcat ggttcagtcc tagcaagaag cgagaattct gagatcctcc 3060
agaaagtcga gcagcaccca cctccaacct cgggccagtg tcttcaggct ttactgggga 3120
cctgcgagct ggcctaatgt ggtggcctgc aagccaggcc atccctgggc gccacagacg 3180
agctccgagc caggtcaggc ttcggaggcc acaagctcag cctcaggccc aggcactgat 3240
tgtggcagag gggccactac ccaaggtcta gctaggccca agacctagtt acccagacag 3300
tgagaagccc ctggaaggca gaaaagttgg gagcatggca gacagggaag ggaaacattt 3360
tcagggaaaa gacatgtatc acatgtcttc agaagcaagt caggtttcat gtaaccgagt 3420
gtcctcttgc gtgtccaaaa gtagcccagg ctgtagcac aggcttcaca gtgattttgt 3480
gttcagccgt gagtcacact acatgcccc gtgaagctgg gcattggtga cgtccaggtt 3540
gtccttgagt aataaaaacg tatgttccct aaaaaaaaa aaggaattc         3590
```

<210> 52
```

41

<211> 3068
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. U81802

<400> 52
```
gaagtcccta tcagattaca cttggttgac tactccggag cagccactaa gagggatgaa 60
caggcctgcg tggaaattga atgagattag ttgagtccac gctccatgag aatgctgaac 120
accatccaaa gcagcaaatt gagattcctt gatttgggga agaggtttgg gaggaaccct 180
tcaataattg gcatgggaca agaggggacc cagtccaagt gtatttggga ctcgcagtag 240
ggaggaacaa ttcagagaga gcttggaagc tcgaagtctg gctgtggcca tgggagatac 300
agtagtggag cctgccccct tgaagccaac ttctgagccc acttctggcc caccagggaa 360
taatgggggg tccctgctaa gtgtcatcac ggagggggtc ggggaactat cagtgattga 420
ccctgaggtg gcccagaagg cctgccagga ggtgttggag aaagtcaagc ttttgcatgg 480
aggcgtggca gtctctagca gaggcacccc actggagttg gtcaatgggg atggtgtgga 540
cagtgagatc cgttgcctag atgatccacc tgcccagatc agggaggagg aagatgagat 600
gggggccgct gtggcctcag gcacagccaa aggagcaaga agacggcggc agaacaactc 660
agctaaacag tcttggctgc tgaggctgtt tgagtcaaaa ctgtttgaca tctccatggc 720
catttcatac ctgtataact ccaaggagcc tggagtacaa gcctacattg gcaaccggct 780
cttctgcttt cgcaacgagg acgtggactt ctatctgccc cagttgctta acatgtacat 840
ccacatggat gaggacgtgg gtgatgccat taagccctac atagtccacc gttgccgcca 900
gagcattaac tttttccctcc agtgtgccct gttggttggg gcctattctt cagacatgca 960
catttccact caacgacact cccgtgggac caagctacgg aagctgatcc tctcagatga 1020
gctaaagcca gctcacagga gagggagct gccctccttg agcccggccc ctgatacagg 1080
gctgtctccc tccaaaagga ctcaccagcg ctctaagtca gatgccactg ccagcataag 1140
tctcagcagc aacctgaaac gaacagccag caaccctaaa gtggagaatg aggatgagcc 1200
tgttcgactg gctcctgaga gagaattcat caagtccctg atggcgatcg gcaagcgggt 1260
ggtcacgctc cccaccaaag agcagaaaac acagaggctg atctcagagc tctccctgct 1320
caaccataag ctccctgccc gagtctggct gtccactgct gggtttgacc accacgtggt 1380
ccgtgtaccc cacacacagg ctgttgtcct caactccaag gacaaggctc cctacctgat 1440
ttatgtggaa gtccttgaat gtgaaaactt tgacaccacc agtgtccctg cccggatccc 1500
cgagaaccga attcggagta cgaggtccgt agaaaacttg cccgaatgtg gtattaccca 1560
tgagcagcga gctggcagct tcagcactgt gcccaactat gacaacgatg atgaggcctg 1620
gtcggtggat gacataggcg agctgcaagt ggagctcccc gaagtgcata ccaacagctg 1680
tgacaacatc tcccagttct ctgtggacag catcaccagc caggagagca aggagcctgt 1740
gttcattgca gcaggggaca tccgccggcg cctttcggaa cagctggctc ataccccgac 1800
agccttcaaa cgagacccag aagatccttc tgcagttgct ctcaaagagc cctggcagga 1860
gaaagtacgg cggatcagag agggctcccc ctacggccat ctccccaatt ggcggctcct 1920
gtcagtcatt gtcaagtgtg gggatgacct tcggcaagag cttctggcct ttcaggtgtt 1980
gaagcaactg cagtccattt gggaacagga gcgagtgccc cttttggatca agccatacaa 2040
gattcttgtg atttcggctg atagtggcat gattgaacca gtggtcaatg ctgtgtccat 2100
ccatcaggtg aagaaacagt cacagctctc cttgctcgat tacttcctac aggagcacgg 2160
cagttacacc actgaggcat tcctcagtgc acagcgcaat tttgtgcaaa gttgtgctgg 2220
gtactgcttg gtctgctacc tgctgcaagt caaggacaga cacaatggga atatcctttt 2280
ggacgcagaa ggccacatca tccacatcga cttcggcttc atcctctcca gctcaccccg 2340
aaatctgggc tttgagacgt cagcctttaa gctgaccaca gagtttgtgg atgtgatggg 2400
cggcctggat ggcgacatgt tcaactacta taagatgctg atgctgcaag ggctgattgc 2460
cgctcggaaa cacatggaca aggtggtgca gatcgtggag atcatgcagc aaggttctca 2520
gcttccttgc ttccatggct ccagcaccat tcgaaacctc aaagagaggt tccacatgag 2580
catgactgag gagcagctgc agctgctggt ggagcagatg gtggatggca gtatgcggtc 2640
tatcaccacc aaactctatg acggcttcca gtacctcacc aacggcatca tgtgacacgc 2700
tcctcagccc aggagtggtg ggggtccag ggcaccctcc ctagagggcc cttgtttgag 2760
aaaccccaaa ccaggaaacc ccacctaccc aaccatccac ccaagggaaa tggaaggcaa 2820
gaaacacgaa ggatcatgtg gtaactgcga gagcttgctg aggggtggga gagccagctg 2880
tggggtccag acttgttggg gcttccctgc ccctcctggt ctgtgtcagt attaccacca 2940
gactgactcc aggactcact gccctccaga aaacagaggt gacaaatgtg agggacactg 3000
gggccttct tctccttgta ggggtctctc agaggttctt tccacaggcc atcctcttat 3060
tccgttct   3068
```

<210> 53
<211> 662
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AW004018

<400> 53
ttttttttc caaacaatta atttataaaa ataacaaaac atttgtctat gaaaaaaga 60
tcaggattca ctctcatcga cgtcctcatc tggatggggc tcagcatcct cctttttcctg 120
ctgctgtttc ttccacagtt tggccatggc caggagtttg aggttaggtt ggttggcagc 180
atcttctgga aagatgtaat caaagtattc ttcccagcct gcatcagacc catcatcagt 240
ctggaccttt cttctcttct tgactttctc tggcatgagt ttgtctactc tctccttatc 300
tgaagctgtt ccaaattctt cttcaaaact tcgccaagat tccagcagca taagtctctc 360
ttccttttct tcacagtttc gcatggtttt gttagcttct tcataaattt gtctgcattt 420
agtcaaactt ccttcttttc ctgaagacaa ctcaaactga gcaaagctga tccatacctt 480
acatgctgcg tccgttgaag caaccgccgg taaaggtttc gtgttctttc tgtttcttcc 540
tgctcaattt caaaatcaat atatgatttc caaagcacct ctggcatgtc taaacgtggc 600
tgactgatgg ctaattcata gattgcccgg gctctgtcaa tatcaccaag gattgtctct 660
aa                                                                    662

<210> 54
<211> 75270
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AF023268

<400> 54
tcccagggtc ccggggttggg ggggtggagc agcatttcgt cgccgcgggg gtgccgggac 60
tccggccgca gtgtcgccgc catcacggac ttcctgtggg acaagcgcac gggcctcgcc 120
gccagaacgg tgagcgcgcg ggttggctgg ccgcgcgaaa agatggcgac cgcggggcgg 180
gcggggttag gcttgggttg ggggcaaggg acgggggcga gatttggaga ggaggagagt 240
tgagacctac gaagcgacgg agtaggagga tgaggggggaa ggaggtcggc ctgcgttaga 300
tgtaccaaga agacctgtag gaagcttggg cggaaccaga ctagaaggga tgatagagta 360
aggatgggag tggttccaga gatgtgaagg agtggaatat caaagttgga ctcgggtcca 420
atcaaagctg gaggggagga atacatcacc gtgtcacttg gaacatgcag gaagaatttg 480
cctgtaggag ttctggattt tctgagtaag aaaggaaaaa gcaaaagatt tcaaacttga 540
gaaaggtagg ctagtgatgt tttgagggga cagtgctgtg aggccgtttg atggtagtat 600
gtggtgagat ggcatttatg tggctatgct gattaggata actatgctgg gaaaatcttg 660
tgcttgcagc ttggtatgct accggcccca gttacaccaa gaatgcatca ataccaccc 720
tcctcaattt ggggaggttg ggaagaagtg tatacagaat ggtggtcaga catcggaatc 780
attaaacctt ttgcatacgc gattctcata cacccccacc aagacttatg tccctgggcc 840
tgtttcattt tattgtgcct tcctattctc atcttcctgg attgtgacag tgattttttct 900
cttttttcct tgaaggaaaa aaaggatttg tgaaccatcc cattccaatt ccattaactg 960
gaaggtggcc agctgtcagc taagtagggc tgatattaat taaaaaccac ttactggcca 1020
ggcgcggtgg ctcacatctg taatcccagc actttgggag gccaaggcgg gcggatcacc 1080
tgaggttggg agttcgagac cagcctgacc aacatggaga aaccctgtct ctactaaaaa 1140
tacaaaatta gctgggcgtg gcggcgcatg cctgtaatcc cagctactcg ggaggctgag 1200
gcaggagaat cgcttgaacc ctgcaggcgg aggttatggt gagccgagat tgcgccattg 1260
cactccagcc tgggcaacaa gagcaaaact ccgttttcaa aaaaaaaaaa aaaaacacaa 1320
gaaacagttg ttatctacgt cttaagcaca agagtggagg ggccagatgg gatgctgact 1380
gtatttgtg gcctactaca ttaaaacctc tcaagggaga gttggccaaa gatgtgagag 1440
atgattaagt taattcaagg ggcccgaccc agatccctgg agctgatagt atttggcgtt 1500
tacctggtat atgtagaaac ctgggagact ggattcctac cctcaggaca ctgatagtct 1560
acttgaggag atgagatgta ctcttaatga gtgtacaaca tttatcataa ctgtaaacca 1620
aagctttact ctattgactt gtgaggaact cagcatcaca cagatctata tcttagatcc 1680
tgaacgggga tacactgtgg cagtctccat cggtcgtcat acactttgct ctgtagtgaa 1740
ctgtgtccta gacctgaagg tcttcatgga gctgtgtttg aagaaaataa ggatagaaca 1800

```
cttgaactgg ctgggtgcgg tggctcacgc ctgtaatccc agcactttgg gaggccgagg 1860
caggaggatc acgagtcagg agtttgagac catcctggcc aacatggtga aaccccgtct 1920
ctactaaaaa tataaaaatt agccaggagt ggtggtgcgt gcctgtaatc ccagctacac 1980
aggaggctga ggcaggagag ttgcttgaac ctgggaagtg gaggttgcag tgagccgaga 2040
ttgtgccact gcactccagc ctggccacac agcgagactc tgtctcaaga ataaaataag 2100
aacacttgaa ctgaggggtg ggtaatgagg gatgggtttg ggggctttct agagtttcag 2160
ccagagttag taggtggctg tactccaata aggaggaatt gtaagtacag aggaagactg 2220
aggaagttgt gcctggtaaa aagaggcaga aataagaggg gaaagcagct tagcatcttt 2280
ggagcagcca gtccttggag gagatttctg aaaactcgaa actttcctat ttccgctttc 2340
ccttgccttc cagatgccgc atcctcgaag gtaccactcc tcagagcgag gcagccgggg 2400
gagttaccgt gaacactatc ggagccgaaa gcataagcga cgaagaagtc gctcctggtc 2460
aagtagtagt gaccggacac gacggcgtcg gcgagaggac agctaccatg tccgttctcg 2520
aaggtgaggc ctcaggaaga gatactcaaa cacagggtca ctcgctcatt cctttgttca 2580
acaaatactt attggttata tgctaaaacc attgccttaa gtagctggct gaaggtaatg 2640
tcgggataga taaccacaga agccatttgg gctgcagtgt taagtgttag aatacataat 2700
gaggaactga ggacgtaccc agtgcgtttg gttggagtgg ggcaggatgt taattcagat 2760
aaaacattgc agaaagcaac atctgtatat gtctggagga caagtagagt caggtggggg 2820
aagtgtcttt gggcagaggg aaagcatgtg caaaggactg ggagctacag gtaactaata 2880
agctaacaga taagacaaag ttagatcttt gtgttttaa ttttttaaaa attttaaaat 2940
atcatttatt tatttttgag acagagtttc actctgttgc ccaggctgga gtgcagtggc 3000
aagatctcag ctcactgcaa actctatggc cccaggttca agttgattct tgtgcctcag 3060
cctcccaagt tacctgggac tacaggcatg cgccatcatg cctggctaat tttttttttt 3120
ttttttttgta ttttttagtag agacaggatt tcaccatgtt ggcctcaaac tcctgacctc 3180
aagtgctcca cctgccttgg cctcccaaag tgctgggatt acaggcgtga gccactgtgc 3240
ccggcccagt tttaatattt tagtggtatg ttcagtggaa agaatgggtt aaggatggtt 3300
tagagcaagg ggggatttca ttcaggaaag cttgagaaaa aaatggctct ttgtttcttt 3360
gtatcactgc agcgggaaaa aggccccaat agggagtggt tctgcagatg cctttttcaga 3420
ggttttggtg acatggcaga tgtgcttggt taacctcaac ttcttctggt cccttggtcc 3480
tctccagtga ctcaaacaag tgtctgagaa cagttttttct tagcattcac tctttgtcct 3540
cactaaggca ggaccttgtc acagggtatg gtagggaatg tgatctgaac agatacacct 3600
cattggtatt tgttatccaa cagcagttat gatgatcgtt cgtccgaccg gagggtgtat 3660
gaccggcgat actgtggcag ctacagacgc aacgattata gccgggatcg gggagatgcc 3720
tactatgaca cagactatcg gcattcctat gaatatcagc gggagaacag cagttaccgc 3780
agccagcgca gcagccggag gaagcacaga cggcggagga ggcgcagccg gacatttagc 3840
cgctcatctt cggtgagtgc cagcccaggc ccttcctctc cccactcttc tgcaggccct 3900
ctaggactct ggtaagtgag cagtatcctt gttctcagct gaacattggg gcatgaacac 3960
tgaggtgggc actgagtttg cctactttct tggaagctct ccgactcttg aagggccctg 4020
gatctgcttt ggagatggat gggcacggag catttgtgac ccccagtgct ctccctggca 4080
tgttgggctt attgtgttgg gagcagcttc tccgccccag cggcctccac tctttaatgg 4140
ggaccttgct tgttgaactg ccttttttccc ccaagccctg ggctctgtag cccccttggc 4200
aggcgggctt gggtgggggc aagggagat ctgtgtctgc ccggaagggc attgtgtaga 4260
gcatggggtt gtgggtgaca ttggcaacaa caccacttct ctgctctgcc catgcctctc 4320
cctgttcctg tttttgggttt ggggacttgg gattatgcgc cgctctctct tctcacaccg 4380
atccacctta ctgcatctga cgtgttccct tccactgtcc cccatcatcg tctgtccccc 4440
ctggctgggc gcctgtgacc ggtgacccct ctaccaccca ccccgcctcc ctccggcccc 4500
cggctccgaa cactgggctt ggttcggaac ccccgctgcc ccccgacagc agcacagcag 4560
ccggagagcc aagagtgtag aggacgacgc tgagggccac ctcatctacc acgtcgggga 4620
ctggctacaa gagcgatgta caagccaaat cgtaacaatc ctatagcctg taatggtccc 4680
atagccatcc taacgtccca agccaacctg agtcacagcc tcttgccttt tgctcagtgg 4740
tgttgtttat ctgggtggtt tgagttgctg ttgagaattg acctctgttg tccactccca 4800
gctctcacgg cccctgggtt aaaggtggtg ggaatcacgc aggggttttc ttccctgtg 4860
accatctgta tctgttcccc ttccttcatc tccaccccag gttgctgtcc cctttttttct 4920
tccaactcag ctcattcccc accttctctc cctccctctc cccgaccctg ctctctttca 4980
tttcagatga aatcgttagc accttaggag aggggacctt cggccgagtt gtacaatgtg 5040
ttgaccatcg caggtaactg tcagtccctc cctactatgt ggggctaaag agatggttgg 5100
ggttatatgg ggcttttttg ctaattaacc tgaggtagaa tttcttagtc ccccctacagc 5160
cctgttcatt ttgagacatt cttgagaacc cagcaaaagc ctctcctgcc aacttacagg 5220
ggtggggctc gagttgccct gaagatcatt aagaatgtgg agaagtacaa ggaagcagct 5280
cgacttgaga tcaacgtgct agagaaaatc aatgagaaag accctgacaa caagaagtaa 5340
gcaagcaagg aagtgtgtag ggaggctgag agccccaacc cctacacggg agagattcct 5400
agacctggtt taggcagaca gggggagtcc tagaccttct catccattca tctttttgttc 5460
```

```
atcatcttag agtagtagaa catcagggta ggaaaggggg ggggcccatg acattcctta 5520
atccactccc cttgttttca gggaagttag attgctctgt cgtttgaccc cagcctagaa 5580
tggcttctgt agagatatac cctggacata gccctaggac tgagcatcaa cctcatcgaa 5640
caatgaatta agctttttata agtagaacta tgctgataag gccacagaca tttatgcagt 5700
aatattttgt tcacatacat tcacagtcca aaaatagaat aaggacttta agccaagata 5760
tgaggccagt aggtataaat aggagcccag tggtagctag tggtgaatga atatcaggag 5820
ttgggctggg gtttgggatt taggatggac agtttgatga ttccaggatc tatactgttt 5880
ggagcttggc actccacagc tcttccagca aatagttttt gaactattta aaatgacgca 5940
ggaagatatt ttgaaacttg ggctgggcat ggtggctcac gcctgtaatc ccagcacttt 6000
ggaggccgag gcgggtggat cacaatgtca ggagttcgag accagcctgg ccaatatggt 6060
gaaaccccgt ctgtactaaa aataaaaaaa ttagccgggc atggtggtgg acaactgtag 6120
tcccagctac ttggaaggct gaggcaggag aatcgcttga acaggaggca gaggttgcag 6180
tgagccaaga tcgcgccact gcactccagc ctgggtgaca gagtgagacg ccatctcaaa 6240
aacaaaaaag aaaaaaacat ggcagatagt accatttctt tcttgggtct ggtagaggct 6300
actccttagc tgaactgaat tttggtgtta gtactagctg gcatggtttt acacaagtta 6360
tgtggaatca acagctatga agtacctcct tgttggatgg ctgatgggca gatgggagct 6420
catcagacaa tcccccttcc cccatctctc ttctcagcct ctgtgtccag atgtttgact 6480
ggtttgacta ccatggccac atgtgtatct cctttgagct tctgggcctt agcaccttcg 6540
atttcctcaa agacaacaac tacctgccct accccatcca ccaagtgcgc cacatggcct 6600
tccagctgtg ccaggctgtc aagtgtgagt ggggtgggcc gaagtggact ctggggcagt 6660
ccctcccttc attggatctc ttctgtcggt tgtgcactgg tgaagcccct aaacagtcag 6720
ctgtctgtta tctgcagttc tttgatttac tgtcatcttg aaacgtcttc tgacttaact 6780
ccttgactga tgtctttatc gtcactgatt gctcttactc tacacctagc ctagcagcag 6840
ctagaagaga aagcctttgg aatcaaagca cttaattacc ctcccctttt cctttctccc 6900
tttcttggga aagcatcagt cagacagcaa acataaagag acaaaaatac actccttagg 6960
gtaaaggctt acatttgtct gggatgagat gttcattcac agcaaaggag atgggaacac 7020
agagtatgta gttcagctaa ggggcaaggt ggggaattca aagaaatata tcattcctct 7080
ggagtcatca aaataataca gtttcacaga attgagttaa cataatgcca gctagacaca 7140
tgtcaaagtg tgtacacact acaactcaaa gcaaactttt ttttttttta catcagttga 7200
gctacatatg tatcttacat tagaaagagc agagcttctt agaccaggca ttccatttag 7260
acgtagagcg gaaagcagcc ctagtgattc tggacctgtc tcctcactgg ctttgcccta 7320
ggtaaccagg cctggggtca gctgatacca gttagctctg gccacctgca ccaagcctga 7380
cctggccttc tcccctacag tcctccatga taacaagctg acacatacag acctcaagcc 7440
tgaaaatatt ctgtttgtga attcagacta tgagctcacc tacaacctag agaaggtaag 7500
atggataggg tctgcccttg gttactgggg gcaggcagct gcaccacttt gccttctgcc 7560
gagccctttg ttttctccct tttatttcgt cctcccacat tttctccctg actggctcca 7620
actgggtaaa actaaatagg ttgaaaggga gaaatctctt aagaagactt aaattgggag 7680
ataacttgta caggggactt cagataactt tccagtagag tgaaagtttt taaggttctt 7740
ggtttgggct ttatttattt atttatttat ttatttattt atttatttga gacagagtct 7800
cactctgttg cccagactga tgtgcagtgg cataatctcg gctcactgca acctctacct 7860
cccaggttta agtgattctc ctgcctcagc ctctggagta gctggggtta caggcacccg 7920
ccaccacgcc tggctagttt ttgtgttttt agtagagatg gggtttgcc atgttggcca 7980
ggctggtctc gaacccctaa cctcaggtga tctgcctgtc tcgggctccc agaatgctgg 8040
gattacgggt gtgagccaca gtgcctggcc cggacttctt ttttgagatg tgtatttctg 8100
tgaggtagga aagctcggct cctttgacta actggagata atgaagatct cagacctaaa 8160
gaagctctcc ctcctttgac ccctttgcta catgttacat attttttagag aaactccttt 8220
gctacatgtt acattttttc agaaaaaccc atttgctaca tgttacattt tttcagaaaa 8280
acccatttgc tacatgttac atgttttcag aataactata tatctggcac ttgagtgtag 8340
tcttcagatg cttacagatg tgcacgctgt tctataatca tttcttaatc cttttgctcc 8400
cctacttcta aaagtattat gctggatgtg gtggaagctg taaaacagga atttcccagg 8460
cttgtaaggc caggcaggag atcacagtac ctttttttaag gctcagaagc aatgtagaga 8520
atactggtgg aatctcagtc tgggtgcaga ggttcatcct ctttctcctc tgctcctaga 8580
agcgagatga gcgcagtgtg aagagcacag ctgtgcgggt ggtagacttt ggcagtgcca 8640
cctttgacca tgagcaccat agcaccattg tctccactcg ccattaccga gcaccagaag 8700
tcatccttgg taagggaggg caaggctgtc caagtgtgtg agatgatgtg agggtggggc 8760
cacctaagcc tcataacacc ttttccctcc cattctcacc cagagttggg ctggtcacag 8820
ccttgtgatg tgtggagtat aggctgcatc atctttgaat actatgtggg attcaccctc 8880
ttccaggtaa gtgatgggat gtcttacttg actgcctggc attcttctac ctggttcctt 8940
tgtttctgc tgaggacctg cctactcagt tctccacatt gcctgccttc ctggcagctg 9000
atccttagca tgcccttttc agtcccatgc tcagtttctg ttttgtttc ccagacccat 9060
gacaacagag agcatctagc catgatggaa aggatcttgg gtcctatccc ttcccggatg 9120
```

```
atccgaaaga caaggtgaac cttgagggg cactagttaa ctctttttcct tttctctcca 9180
cagaattggt ctatttcaca tcatttttctt ttttctttga tacctcctct cccccccagtt 9240
actttcagat ggggaaataa gggaattgta acaagggtga ccttctgatt cctcaacctc 9300
cccttccct ctagaaagca gaaatatttt taccgggtc gcctggattg ggatgagaac 9360
acatcagctg ggcgctatgt tcgtgagaac tgcaaaccgc tgcgggtgag ctgggctcgg 9420
gataaatagt gcccaccgtc cagaagtcac ttccttctta gggtggttgc cccctggaat 9480
gctcttcaac aagccagagg gttaggaaag gaggggagga aagctgaaag aagacatctt 9540
tggtcaacag aggaaacata agagggagtg gttttgcgga gggaaggagg ttagacagcc 9600
taaccttgag acaaccagag atcaaagcaa tgtcctggat tctttaggtc agacagaaaa 9660
gaataaacta cccttgaaga gcttacattt taatgaggaa ctaaagaaga ttcatgaagt 9720
tgacaaggat atacaagtag aaagaacttt caaagattat ggagtaattg tgctagaggg 9780
aaggtaggtt gagctataat atcagaaacg ttggtcctgg tgtggtcgtg gttaggtagc 9840
cttcaaattg gttgcaagca gagccttggt tctccaagaa tgaaaggtag ggtcttgaag 9900
aaggcaggggt ttgtaaggca tcctgcctca ccttttttcct gccctcctcc accagcggta 9960
tctgacctca gaggcagagg aacaccacca gctcttcgat ctgattgaaa gcatgctaga 10020
gtatgaacca gctaagcggc tgaccttggg tgaagccctt cagcatcctt tcttcgcccg 10080
ccttcgggct gagccgccca acaagttgtg ggactccagt cgggatatca gtcggtgacg 10140
atcaggccct gggcccccct gcatctttta tagcagtggg tgtccagtcc aggacactgg 10200
tgcttttta tacaagagaa cgagccagag ttcactcctt cctcctggct ctctatatac 10260
ctgtgaatat gtgaaatagt gtaaatatga aagaacttgt acctatcact tcaacccctg 10320
ccttgtacat aatactattc catccacaca gtttccaccc tcacctgccc cctcatacgg 10380
agttggatgg gggccgagtg aggtaaccag gtggcatcta ccccatgttt tataaggaat 10440
tttgtacagt ctttgtgaaa taaaataacg tgcttcattt gaccccccatc cctggagttg 10500
gaggtttggg aatgctgggg tggagggatg aaactattgg caaactttct gagtttgggt 10560
atgaagggag tcctccttac cctccaaaat gaagcacagc caggctacca tttatttccc 10620
ctgtccacct tatcatatgg gagggtagtg atgggtgggg cagcatttct ttcagattaa 10680
aacagagaag tgttatgagg tggcacttct cggatgtgga attatgagag ttgggaagat 10740
ctgactccta gagtcattag gccgcggccc agtatagagc cagaaactca ggttgaaaac 10800
gtgctcaacc tggctcctag gggggattgc caggaccggt cagaaggctc ccgtcgtcca 10860
tctcgggaga ctaggaaggc cggattccta cgcgaggcct gctgggaagt gtagttcgtt 10920
agtggaagga agtcacatgg aagagggggcg gtagttggtt gtgggcactg ggttagaggt 10980
atcacgtggg ggcactttcg tcttagcttt tggacaagac gcaggcgcaa acccacggct 11040
gctgcggggg atccttgtgg cccttttccgg tcggtggaac caatccgtgc aacagagaag 11100
cggggcgaac tgaggcgagt gaagtggact ctgagggcta ccgctaccgc cactgctgcg 11160
gcaggggcgt ggagggcaga gggccgcgga ggccgcagtt gcaaacatgg ctcagagcag 11220
agacggcgga aacccgttcg ccgagcccag cgagcttgac aacccctttc aggtgacttg 11280
cgccagtcgg cctcttttgg gcggtcaggt tgattcttcc cggttctgta gggtcgggct 11340
aacttgtatc cccatttgtg acatttgatc ctgggaagag ccgccacgtg gggtgacagt 11400
gactccagac cagtgagcac tctgggggc gggccctgcc ccttaatggg ctggtgctgg 11460
cagtgttgga tgatggattt gaggtaaatg ttgtcccagt cctgggacaa cggcgtggcc 11520
ccgaaggtgc agtacttgga gccacaggca gtttgggaat ggtccctggg aattccccta 11580
ggtggcactg ggtgccagct gagacccggg tctctgccct caggacccag ctgtgatcca 11640
gcaccgaccc agccggcagt atgccacgcg tgacgtctac aaccctttctg agacccggga 11700
ggtgagctac tggagagcat aggagttcaa ggaagggaag ggtttgccag tgagacaagt 11760
tagcttgggt acaggggact tttctgcatg cacaggaagg aagaggcact gtgatcttag 11820
ttccctgaga gaggctagtc agccatggga tgcctcatcc ttctagggcc accagggcca 11880
ccaacccaaa tggtttgagc tctaaaagtc agtcctggga agatctggag gctggcaagg 11940
ccttaaccaa tgttctgtat gggaaggctt tcttgaagaa aataaaggtt ggggctggtt 12000
ggagtttagg ttaggtgtgc agtttgaaag caaggaatga ggaggactac acctgtttgt 12060
cccactggat tagaagatgg tgagttgtaa gaatttaagg ggttttcatg gtacttaaaa 12120
cttaaaaaaa aaagccaagc atggtgtgca tgcctgtaat cccacttggg aggctgaggt 12180
gggaggattg cttgagccca ggaatttgat ggagaccatc ctggcaaca gcgagacccc 12240
catctcttga gacgttttaa aaattggcta ggtgtagtgg cacatgcctg tagtccttgc 12300
tacttgggag gctgggatgg aaagactgct tgggcccagg agtttgaggc ttcgatgagt 12360
gatgattgca ccactgcact ccagcctggg tggcagagag acaacccccac actccatccc 12420
cagaagaaaa gagaaaaaaa aaacacagtt aagtggggag atatggtaaa tgagtgattt 12480
gagtcctcac taaggaattg gatatgaggg atgataaggc tgctacaggt catcatagag 12540
ttctctgaca gaaattcaac agaagaacta gcttcctaac aaatgggggga aaggctgctt 12600
ccttacatca tgagttctgg gtctaaaggt attcaagcag actatagatt cctgtgttat 12660
gagggactag atgatcacta aggtcttttc ctcaacagcc accaccagcc tatgagcctc 12720
cagccccctgc cccattgcct ccaccctcag ctccctcctt gcagccctcg agaaagctca 12780
```

46

```
gccccacaga aacctaagaac tatggctcat acagcactca ggtacaggag gtgtgcaggt 12840
gagggctggg gagaagggcc agtcctgggg cccagggctc acatctccgt ctgctcacac 12900
tgggcaggcc tcagctgcag cagccacagc tgagctgctg aagaaacagg aggagctcaa 12960
ccggaaggca gaggagttgg accgaaggga gcgagagctg cagcatgctg ccctggggg 13020
cacagctagt aagtaataga gtggggaaga gcatctgaga gtttgggagg agcaaaaaca 13080
ggtcttaagg gcctgggctc ggctgggtgc ggtggctcac acctataatc ccagcacttt 13140
gggaggctga ggtgggcgga tcacgaggtc acgaggtcaa gaaatcgaga ccatcctagc 13200
caacatggtg aaaccctgtg tctactaaaa atacacacac acaaaaatta gctgggcatg 13260
gtggcgcgca cctgtagtcc cagctactcg ggaggctgag gcaggagaa tcgcttgaac 13320
ccgggaggtg gaggttgcag tgatccgaaa tacgcgccac tgcactccag cctggtgaca 13380
gaaatgagac tccatctcaa aaaaaaaaa acacaaacct gggctctgga gtcagactgc 13440
tgagtttgaa ttttagagat actgcttact aaccatgagc ttttagggaa gttacttaat 13500
cttgaatgcc tcagtttccc tatttataaa atgaaaacca cgtttgcatc cgtttgacag 13560
ggttgttgtg aaggttaaac aaaatatatg tgaagtactt ggtacagtgc ttagatgttt 13620
taaataataa taaacagtat taatttttcc actctcactt gtctccttgg accccaaatt 13680
ggagataaaa gagaggatcc agggctgggt atggtgcctc acgcctgtaa ttccaacact 13740
ttgggaggcc gaggcaggca ggttgcttga gttcaggagt tagagaccaa cctggacaac 13800
atagtgagat cctgcctcca aaacattaat gaaaaaaatt agcagggcat gatgtacctg 13860
tctgtagtcc tagctcctca agaagctgag gtggacggcc aggcgccggg gctcatgcct 13920
gtaatcccag cactctggga ggccaaggcg ggtggatcac ctgaggtcag gagttcagga 13980
ccagccaaca tggtgaaacc ctgtctctac taaaaataca aaaattagct gggcgtggtg 14040
gcatgtgccc ataatcccag ctactcagga gactgaggca ggagaattac ttgaacccgg 14100
gaggcggaga ttgcactgag ccaagatcac accactgcac tccaacctgg gcaacaagag 14160
cgaaactcta tctcaggaga aaaaaaaaa aaaaaaaaag ctgaggtggg agggttgctt 14220
gagcccagga ggttgaggct acagtgaacc atgatcatac cactaccttc cagcctgaac 14280
aacagagacc ctatctcaaa aaaaaaaaaa aaaaaaaaag agaggatcca gggatggaga 14340
gaaggggag tgattcctttt gttggtctct gttttacttc tggggtccac ctgtttttttg 14400
gcgccttaca gctcgacaga acaattggcc ccctctacct tcttttttgtc cagttcagcc 14460
ctgcttttttc caggacatct ccatggagat cccccaagaa tttcagaaga ctgtatccac 14520
catgtactac ctctggatgt gtgagtagtg agaagccttt tggaggaagt tacaggtaga 14580
tctcttaact gccctggggt ccgctcacca agaaccaaac acttcacctc tatttagaac 14640
tcaccagcct gctagcaaat gttcttgccc tctccccact ttttattgtc catatgcagg 14700
aatatatttt gaattctttta gatgtctttg ggctgggtgc agtggtatac gcctgtaatc 14760
ccagcacttt gggaagctga ggtgggtgga taacctgagg tcagaagttt gagactagcc 14820
tgatcaacat ggagaaaccc catctctact aaaaatacaa aattacctgg gcgtggtggc 14880
acatgcctgt aatcctagct actcaggagg ctgaagcagg agaatcactt gaacccggga 14940
agtggaggtt gcaatgagcc aagatcatgc cattgcactc cagcctgggc aacaagagca 15000
aaactccatc tcaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaggc cgggcacggt 15060
ggctcacacc tgtaatccca gcactttggg aggcccaggt gggcagaaca tgaggttagg 15120
agatcaacac catcctggct aacacggtga aaccccgtct ctactacaaa tacaaaaaat 15180
tagccgggcg tggtggcggg tgcctgtagt cccagctact taggaggctg aggtaggaga 15240
atgggcgtga acccaggagg cagagcttgc agtgagccga gatcctgcca ctgcactcca 15300
gcctgggcga cagagcgaga ttccatctca aaaaaaaaaa aagaaaaaaa aaaattagct 15360
gggcgtggtg gcgggcgcct gtagtcccag ctactctgga ggctgaggca ggagaatggc 15420
gtgaaccggg gaggcggagc ttgcagtaag ctgagattgc gccactgcac tccagcctgc 15480
gcgacagagc cagactccgt ctcaaaaaaa aaatgtctt tgcaaggga tcacacatta 15540
ttgacatttg cttttctccat ctcccctgtt gaggattcca tgaaggcagc agctgccttc 15600
atttccttac tctgccatgt ttggtgaata ttataggatg agcatagatg ggaaggagcc 15660
ttcattgcag tccagaaggg ctcctcatcc tgtccctctg ccccttaggc agcacgctgg 15720
ctcttctcct gaacttcctc gcctgcctgg ccagcttctg tgtggaaacc aacaatggcg 15780
caggctttgg gctttctatc ctctgggtcc tccttttcac tccctgctcc tttgtctgct 15840
ggtaccgccc catgtataag gctttccggt aagtgtgtta gtggtgggag agtgatggag 15900
acctgggatg ggccccacgt ctgcccatcc ttcagctcta attcttctcc caccctcccc 15960
attttttttcc tctttgtagg agtgacagtt cattcaattt cttcgctttc ttcttcaatt 16020
tcttcgacca ggatgtgctc tttgtcctcc aggccattgg tatcccaggt tggggattca 16080
ggtttgtgag gctgttatcc accctcacct ttccctctag atccagccag cactgggtgc 16140
tggataggag ttgttcagaa aaaggaaatg tggttttaat ccttgggagg tactagttta 16200
atgagataca agacatactt ccaggataga gcgcagacag cactcttgac acatatagat 16260
tgaaggggaag aatgctgcat ttggccaatc taaggtggct tcctggagga ggcatagaac 16320
catggttgaa aggaggaaga agaatcccca gatgagtgcc tggaagagct tggagagctc 16380
agggctaatg gttcagaaac tggaattaaa ctatgaagag attagataca gtttgggatt 16440
```

```
gtggtgcttg gaatgctgct cgattgacag ggagccactg ctgatgggaa gggtaggaac 16500
aggggatgct ggtgacataa ccagtggaga agctgaggag cccctcttca ctggtacatc 16560
cttcccttta cagtggctgg atctctgctc tggtggtgcc gaagggcaac acagcagtat 16620
ccgtgctcat gctgctggtc gccctgctct tcactggcat tgctgtgcta ggaattgtca 16680
tgctgaaacg ggtgagggct gtgtcgaagg tggggccggg atggtgagat catgggtccc 16740
caggggcgtg ggtggaacat tcaggagcaa ctggcacagg tcaggctgct gggttgttct 16800
cagctaatgg acctctgggg tgtgtgtttc tgtgtgtgag tgtgtgtgct gggcagcagg 16860
ctgctgagtg gtagtgatgc tgttaggctg ggggtggggа accagtggct ggaatgggcg 16920
gtaatgtctt tgtcctctac ttgcagatcc actccttata ccgccgcaca ggtgccagct 16980
ttcagaaggc ccagcaagaa tttgctgctg gtgtcttctc caaccctgcg gtgcgaaccc 17040
gagctgccaa tgcagccgct ggggctgctg aaaatgcctt ccgggccccg tgacccctga 17100
ctgggatgcc ctggccctgc tacttgaggg agctgactta gctcccgtcc ctaaggtctc 17160
tgggacttgg agagacatca ctaactgatg gctcctccgt agtgctccca atcctatggc 17220
catgactgct gaacctgaca ggcgtgtggg gagttcactg tgacctagtc cccccatcag 17280
gccacactgc tgccacctct cacacgcccc aacccagctt ccctctgctg tgccacggct 17340
gttgcttcgg ttatttaaat aaaaagaaag aggaactgga actgacatcc ccgtttcctg 17400
aatcttcatt gggaattagg ccttatgaaa gagaaaggag agtgtggagt gaggtgggaa 17460
ggtcggaccc ggctttagtg taaactggga gagagatgag gggcggggcg gtggagcccg 17520
agtggctggc gcaggaagga ggtgggaagt ccacggaaac gcgaaacccg gagacgccag 17580
ggagccctgc tccccacccc tctccattaa tgacggggaa gagccaccgc ctctgccggg 17640
aacgccaagg aatacgcggg cctggagcct gaaaagctgg atggggctca agtggaggcc 17700
caaaggatca ctagcagcct agccagggtc cagagcgagg cagggactgg aggagcgctt 17760
atccgactgc ctcgccctgc cgcgggatcc cccaaccccg acagggtctc agtcccgaac 17820
tacaactccc ggggtgcacc gcgccggccc tcgccgccat gcccctcctt cccgcaccat 17880
ccccattccc atcccccttc tctagtcccc gacctgcggc agccggagct cggggagcgg 17940
agcgtggtgg ggaggggagc gggacaggcg acacaggaga cagcggcgcc gcggcctctc 18000
cccaccaggc ggccccggat cctactggac gccctgaggg cacaccgacc gcgcctctag 18060
agtcacccca cgccgacccc tcccctcttc tctagactta tttccatcct tcccgctttt 18120
accctcccca cccgtccctg ggctccaggc cgccgccccc tcctcactcc tggaccggcc 18180
cttctcggtg cccctcttcc ctagggagat gcgatgagcc ggtgcccccg cgtcctcatc 18240
gtcgccccgg gcacggtgcc cgtccagtgc ccgtggtggg gagggagcac tccgcggtcc 18300
ctccgtgacg cccctcgctt ggcccccccc acagctggcg tccctcggcc atgccccagg 18360
ggacccagcc aggggtgggg ctctagagcg agtgggggtgg agaggagaaa ggacgggggcc 18420
ttgggggcct ctgagatgct cccaagtgcc agggagggcc gagcgaggcg caggcaaccg 18480
ggcagcaggc atgatgccct cgcctagtga ctccagccgc tcgctgacca gccggcccag 18540
caccagggggc cttacccacc tccgcctcca ccgaccctgg ctgcaggccc tgcttacgct 18600
ggggctggtc caagtgctcc tgggcatcct ggtggtcacc ttcagcatgg tggcctcttc 18660
cgtcaccacc accgagagca tcaagaggtc ctgcccgtct tgggctgggt tctcggtgag 18720
ttgggtgcac agttgttggg tgggggaggc tcctcgggcc ccaccctcca ccagctgc 18780
aagtccacat gcttgcctct cctccctctc ctggtcctct gcctccttac agggctgggt 18840
gcatcctgtg gtgaggggct cactcaggag cctccccctg ccaggctgag cctgtgccca 18900
ctctgtcccc agctggcgtt ctccggggtg gttggcattg tgtcctggaa gcggccattc 18960
actctagtgg taggtgccag ggtccagtgc ccactgggag gcaggtgccc agcacgcaag 19020
gggaagccca tttatgacct caagaaggga actggctcgg cagttggtgc cagccgggtg 19080
ggcacgaagt tctgtgaagg aggggggactc tgtccgtggc agaggagtac tcatgagggt 19140
cccagccctg agtctgcacc ctgttttccc cagatctcct tcttctcctt gctttcggtg 19200
ctctgtgtca tgcttagcat ggctggctct gttctctcct gtaagaatgc tcaactggcc 19260
cgagacttcc aacagtgctc tctggtgaga tttgaggagg gagagctgga aagaactggc 19320
tgggggaggt gtgcaggaca cctcagtttg tgctgactca ggctgcctca ccctccctgc 19380
tccactcagg aaggaaaggt ctgtgtgtgc tgtccctctg ttcccctcct ccggccctgt 19440
ccagagtcgg ggcaggaaca gaaagttgcc cctaactcca cctgtgatga agcccgaggg 19500
gccctcaagg tgagcttgca ccctgcaaac atcctcctgg ttctcactct tgcctcccct 19560
gctggggatc tcacaggccc ataatgtgtg gaacttagcc gtctcctgac tcctctcctc 19620
ctttcccttc cccagaacct gctcttcagc gtctgtgggc tcaccatttg tgccgctata 19680
atctgtacac tctctgctat tgtctgctgc atccaaatct tctccctgga cctcgtgcat 19740
acggtgagaa gggagcaggg gccagggcac gcaggtatgg tgggggcagg ggtgtgtgtg 19800
ctgagacttg cctgagggaa caatggctac agatctggct tttgagcacc aggggctatg 19860
ggttatctat tatcctcatc tattggagga atggatgttt agtggggagg atgagaaggg 19920
gagatggcag ggagtgagtt aagtatgtga tgctggtctg gaccaggag agggtgcttt 19980
agagaatggg actggatggt ggggtagagt caagaaggtc ctatgctggg cacggtggct 20040
cattcctgta atcccagcac tttgagaggc ccaggcaggc ggatcacctg aggccaggag 20100
```

```
ttcaagaccc acctggccaa catggcgaaa ccctgtctct attaaaaata caaaaatcgg 20160
gccgggcgca gtggctcgtg cctataatcc cagcactttg ggaggctgag gagggcagat 20220
cacctgagat caggagatcg agactatcct ggctaacatg gtgaaacccc atctctacta 20280
aacatacaaa aaattagcca ggcgtggtgg cgggcgcctg tggtcccagc tactcgggag 20340
gctgaggcag gagaatggca tgaacctggg aggcagagct tgcagtgagc tgagatagtg 20400
ccactgcact ccagcctggg cgacagagca agactccatc tcaaaaaaca aacaaacgaa 20460
atacaaaat tagccaagt tggtggcggg tgcctgtaat cccagctact gggagtctg 20520
aggcaggaaa attgcttgaa ccggggagtc agaggctgca gtgagctgag atggtgccac 20580
tgcattccag cctgggcgac aagagcacag actccgtctc aaaaaaaaaa aaaaaaaaa 20640
aaaaaaaata tatatatata tatatatata tatatatata cacacaaaat tacaaaaatt 20700
aggctgggct ccgtggctca tgcctgtaat cccagcactt gggaggcca aggcaggag 20760
atcaccagat atcaggagtt tgacaccagc ctggccaaca tggcgaaacc ctatctctac 20820
taaaaataca aaaattatcc gggtgtggtg gcgggtgcct gtaatcccag ctactcggaa 20880
gactgaggct ggagaatcgc ttgaacctgg gaggcagagg ttgcagtgag ctgagatgta 20940
gccattgtac tccagcctgg gcgacaagag tgaaacttcg tctcgaaata ataataataa 21000
taataattag ctgggcatgg ttgcacaccc ttataattcc tgctactcag gaggatgagg 21060
catgggaatt gcttgatctt gggaggtggg ggttgcagtg agctgagatc gcgccactgc 21120
actccagcaa cagagtcaga ctctgtctca aaaaaaaaa gaaggtccta gatggaggtg 21180
aggctaaagg gtggacattc ctgtgaagac acagaatgtg tggagcttct ggatggaggt 21240
ggggccataa agaggaattt gtgggtgggc agggccagag gctagaggta cagggtgacg 21300
gtggggttaa ggagagctga tttttgggtga gggagggggcc agaataagag cttctctcag 21360
gggatagggc cagaaaaaat aatgtagatg agagaggagt ttggggccca ggaggagctg 21420
tattcccaga atccagactt gctgacctgc tcgcttcccc agcagctggc ccctgagcgg 21480
tcagtctcag gcccactggg acctctgggc tgcacgtccc cgcccccagc ccctctccta 21540
cacaccatgc tggacctgga ggaatttgtc ccgcctgtgc ccccaccgcc ctactatccc 21600
ccagagtata cctgcagctc agaaacagat gcacagaggt aaggcctggt ggggtcttgc 21660
tggggggagct aaggaagggg actggggctg ggcctggatt gctggagaga gggatctttg 21720
tggagggggga attatttctc ctacattgac cctcttcctc atctgccagc atcacgtaca 21780
atggctccat ggacagccca gtgcccttgt accctaccga ttgccccct tcttatgagg 21840
cagtcatggg actacgagga gacagccagg tgagagcaca gcacggcttg gggcgggctg 21900
gggagccggg ttgtagcctg gaaagctgaa caggctgtag cctctggata aagatagtaa 21960
cagtggtcaa ggtctttaca gcaccagcat gcccactgtt gcctttgatc ttccctagag 22020
cctggtgagg tgagtgggtt ggaagctatc atttctgcca tacagacgtg gaagctgagg 22080
ctgcacaatt aagtgacttg tacaaaggga caaggctggt ctggaatcta agtctccaga 22140
gctctgtcta gcacatgggg gtgttcagtg tgtagggctg aacccttgac cctgtgtctt 22200
ctgcaggcca ctctctttga ccctcagctt cacgatggct cgtgcatctg tgaacgagtg 22260
gcctccattg tagacggtga gcagggcgta atgagggggtg gacaagggcg gggctgccag 22320
ggatagctgg ggtgggtaga gacaatagaa ggggaaaaca aggcggagtt ggtggtttgg 22380
ggacatagga gggctgtggc aacttggaac cctggactta tttttctcct ctgagataaa 22440
gctggaggca cagtggcccc tagaggctgg gcttgggaga agaggaactg cctgggcagg 22500
gctaggccag gccaggctgg tgctacacag cgcccctgc⁄cgcccacagt gtccatggac 22560
agcgggtctc tggtgctgtc agccattggt gacctccctg ggggctctag cccgtcggag 22620
gactcgtgcc tgctggagct gcagggctcc gtgcgctccg tggactacgt tctctttcgc 22680
tccatccagc gcagccgtgc cggctactgc ctcagcctgg actgtggcct gcggggcccc 22740
ttcgaggaaa gcccctgcc acggcgcccc ccacgggctg cccgcagctg ccaccggttg 22800
gcccctgaag ctccaccccc actgggtgcc cccacagctg cccgcagctg ccaccggttg 22860
gagggctggc cgcctgggt gggaccccgcc ttccccgagc tgaggcggcg ggtccccccg 22920
ggaggggcc gcccagccgc agcccccgcc acccgagccc cgactcgtcg cttcagcgat 22980
agctcaggtt ccctcaccc accggggcac cggcctcctc atccggcatc cccaccaccg 23040
ctgctgctgc cacggtccca cagcgaccca ggcatcacga cctccagtga cactggtgag 23100
cccctcccc gactgcccag gctcaggaga gggtaggcac tgggagttag gtggccagtg 23160
atgcccacca ggattggggc acagttgagg tgggtgagga ggaagaaagg gtgagttcac 23220
tcctctggta gacattctca ggtactcacc tcctagggac agaacatcca tagcttagca 23280
gctaaaaaag gagaattttt ttttttttt gagacggagt ctctggctct gtcgcccagg 23340
ctggagtgca gtggcatgat cttggctcac tgcaacccgt ttccgggtt caagtgactc 23400
tctcctgctt cagcctgccg agtagctggg actacaggtg tgcgccacca tgaccggcta 23460
atatttttt tttttttttt ttttgagacg gtgtctcgct ctgtcaccca ggctggagtg 23520
cagccgcgcg atctgggctc actgcaactc cgcctccgg gttcacgcca ttctcccccg 23580
ggttcacgcc attctccttc ctcagcctcc cgagtagtga gtagctggga ctacagatgc 23640
ctgccaccac gcccggctat tttttgtatt tttagtagag atggggtttc accgtgttat 23700
ccaggatggt ctcaatctcc tgacctcgtg atctgcccgc ctcggcctcc caaagtgctg 23760
```

```
ggattacagg catgagtcac cgtgcccggg caattttttgt attttttagt agagacaggt 23820
ttcaccctttt tggccaggct ggtcttgaac tcctgacctc aagtgatcca cccgcctcgg 23880
cctcccaaaa ggatttattt tttgaaacca gttccacagc tctcagcttg gtccacttat 23940
ctgtcctccc caagcttcag ctgtcacttg ttaacatgta taataatagt acttcacgcc 24000
gggcacggtg gcttgcacct gtaatcccag cactgtggga agctgaggtg ggtggatcac 24060
ctaggtcggg agttcgagac cagcctggct aacatggtga aaccctatct ctactaaaaa 24120
tacaaaaatt agccaggtgt ggtggagcgc gcctgtaatt ccagctacta acgagagagg 24180
ctaaggcagg agaatcgctt gaacctggaa agcaggggtt gccgtgagcc aagatcatgc 24240
cactgcactc cagcctgggt gacagagaca cactccatct caaaaacaca aacaaacaaa 24300
caaaaaacat gtataataac agtacttcag ccataggcat tgtactcgaa gatgctgaga 24360
aagaacagtg gcgggcaagg ctgttcacac ctataatccc agcactttgg aggccaaggc 24420
aggtggatca cctgaggtca ggagttcaag accagcctag ccaacatggt gaaacccccа 24480
tctctactaa aaattgaaaa attagctggg cctggtggtg gacgcctgta atcccagcta 24540
ctagggaggc tgaggcagga gaatcgcttg aacctgggag gcggaggttg cagtgagctg 24600
agatcgtacc actgcactcc ggcctgggca acacagtgag actccatctc aaaaaaataa 24660
gaaaggagat agtactgggg aacgctcagc actgtgcgcc aggtgctgaa caacaccact 24720
gcagtccttg ttgtggtgga ttgtaccatc tagttgctgg ctaatatgga cagagatgct 24780
ggcccttttga ttggggatgg agcgtgggag ctgtgaaagc tcctctgggc ttgagttccc 24840
acaggagggt gggcgtgtcc acagaacact tccactcact ccctgtctcc ctttctctct 24900
tctccccagc tgacttcagg gacctttata ccaaagtgct tgaggaagaa gctgcttctg 24960
tttcctctgc agatacaggt caggcatgtg gtttgcgccc cagggatggg gattgggcat 25020
ggctgcccag cccctctcc accctacaat accattctct tatctctgtc tctctgcagg 25080
gctctgctct gaagcctgcc tcttccgcct agcccgctgc ccttcccca agttgctacg 25140
tgcccggtca gccgagaaac ggcgccctgt gcccaccttc caaaaagttc ccctgccctc 25200
gggccctgca cctgcccact ccctggggga cctaaagggc agctggccag gtcggggcct 25260
ggtcactcgt ttcctccaga tatccaggaa agccccagac cccagtggga ctggagctca 25320
tggacataag caggtaggaa ttcggggagc caggaaagat gtttgggaaa gcgtggagct 25380
tcagattgag ccttattgat gatgcccttt cttgtgtccc tgtccaggtg ccccggagcc 25440
tgtggggccg gcctggccga gagagcctcc accttcgcag ctgcggagat ctgagctcta 25500
gctcttccct gcggcgtctc ctgtctggcc gcaggctgga gcgtggtacc cgcccccaca 25560
gcctcagcct caacgggggc agccgggaga ctgggctctg acctaggctt cttgtcacac 25620
tgaacacatc cagccacagg caccagctgg ttgggaccag cagcccccag catcctcttg 25680
cactggctgg cacaaaaaga aacctgctgt ataccccca aagtgtccct ttcctccta 25740
cctctggggt ctcttgctgc ttgcctctgc tgctctggtc tgggagagct tctgtcctgt 25800
gctgcatggg tatttagact gtgggggaga tgccccttct tatagcactg gaggaggaaa 25860
acaaattctt gtccccctca gaatgagagt ggctctttct gatttgcaag ggcactatgg 25920
tcagggcaaa ggcatggccc aggtgtttaa gtacagggtg acgtgtgcct atgcaatggg 25980
gtggtaaggc aggcacgaag agtccaaaaa atctaggtgg cctctcagct ctgccacctc 26040
tagctgcatg accttgggca agctatgtaa ccccaattgc ctgctccatt aaagactgtg 26100
aaggtagaat gtttgtaaag ctcttaacag tatgtaagcc ttcaataaat ttcagttttc 26160
cccttgtttt cttgatcatt ctctgtcacc agtgaaattt gttctagtgt ctctcatatt 26220
taagaaaact cttttcaggac tgggtatggt ggctcacacc tataatccta gcactttggg 26280
aggccgaagc aagaggatcg cctgagccta ggaattcaag accagcctag gcaacatagt 26340
gagaccctgt ctctacaaaa aacaaaaaat tagccaggca tggtggggaca cgcctgtagt 26400
cccaactact caggtggcta aggtgagagg atcacttgag cttgggaagt ccaggctgca 26460
gtaagctgtg attgagccac tgcactacag cctgggcaac agagcaagac catgtctcaa 26520
aaaaaaaaaa aaaagaaaaa agaaactttc aagacactct ttccaaccac taattgtaac 26580
tctgctcctc ctttttcacag caataggttt tcttttttctt ccctccactg ttaaacatcc 26640
attctctcct cacccacccc catcagactc cttcccctat ctttccacag ccactgctct 26700
gaccaaactt tccagtgacc acagtggtgt cagacccagt gaccatttct ctgcctgcat 26760
ctcacttgac ctcgaggcag caattaatac ccataatcag catcttcttg aatttgtccc 26820
tttgaaaagg gaaatattgg ctcttctact ttgtcctgct gaactgctta acattggagg 26880
gccccagggc cctcacctaa gccctctttc ctacctccac tctttctata ggtggcccta 26940
ctactaaagt ccatggcttt aaataccatc tttctatgtg ttaatccatg actccagcct 27000
tgacctccca tgagcgccat ccaactcagc atgtctgctt ggatgtctaa tgggcatttc 27060
agattcaaca tggccacaac tgaactcttg attcccaccc cagcaccggt tatttttcca 27120
ctgttcccat ctcaatggca cctccattac ccatttgcac attccaaaag ctcaggaacc 27180
atggtgactt ctttttcccat atccaacaca accaatccta tcctgaattc atccacatcc 27240
caccacctcc ccagctacct agctccagcc atcctctctc cacaacctct gaatcagtct 27300
ttcactttttc ccagcaatcc attctccact cagcaaaatg atgataaagc acgtcacatc 27360
aaggctctgc ctcaatttaa tggcttccca ttgtatttag aatcatctcc aaactcccag 27420
```

```
agactatggt cgagctacaa tctggcccac cttctgttcc agccaaattt cctcacagca 27480
caaggacgtt tgcacctgct gttttgccaa gcatgaaacc cttggcccct atatctggtg 27540
ctatcaccta atatcaggtt ttagctccat tctcaccatt tcagtgagca cccaatcccc 27600
atcgcagtca ttctatcaca tagccatgtt tttttttgtt tgtttgtttc attttgtctt 27660
tttttgagac agggtcttgc tttgttaccc aggctggagt gcagtggtgt gatttgggct 27720
cactgcaacc ttccacctcc tgggtcaagc aattctcctg cctcagcctc ccgagtagct 27780
gggattacag cgcccgtcc ccatgcccgc ccagctaaat tttgtatttt tagaagagat 27840
agggtttcac catgttggcc aggcgggtct caaactcctg acctcaagta atccgcctgc 27900
ctcggtctcc caaagtgctg ggattacagg tgtgactcac cgcgcctggc cacataccca 27960
tggtttcagc atgtatcact atctaaaatt attattttg tttatatatc tgtgtcgtcc 28020
catagaaggt taaggtccca agatcagaaa cttgctcatt gcagtgggtc taacactcag 28080
taggtcctca acaaacattc gttaagatac taaagtggca gggtggggcc ctgtaaacag 28140
cttcaggagc ttcaggaccc tgtgcttgta ggggcaacgt ggtgccctcc aaggaagaca 28200
gggaggtggg aggagcactg cccagagatg gcgtcaggct gcaagacttc ttgaataatt 28260
cagcatcata acaacccagc ctcaggaagg gatagggcac ggccaggacg aaacattagg 28320
aggcgatgga caatgggatt cccacggggc agcttctgcg cactggacgt tccctaacct 28380
gaggctctct aaagaggaag gttaggaatc ctctgagctt cggtgggctg gactcactgt 28440
gggaattcaa tcgcccccat ccaccaacag tgtgctggcg ggaaaacgcc gacacgcatg 28500
cgtagttctc gcgccggctc ctctctctct ctctctctct ctcgctcgct ctctcgctct 28560
ctcgctctct ctcgctcgct ctctcgctct cgctctctct ctctctccgg ctcgccagcg 28620
acacttgttc gttcaacttg accaatgaga cttgaggaag ggctctgagt cccgcctctg 28680
catgagtgac cgtctctttt ccaatccagg tccgcccgac tccccagggc tgctttctc 28740
gcggctgcgg tgatcggtcg ggctgcatcc tgccttcaga gtcttactgc gcggggcccc 28800
agtctccagt cccgcccagg cgcctttgca ggctgcggtg ggatttcgtt ttgcctccgg 28860
ttggggctgc tgtttctctt cgccgacggt aggcgtaatg aatatttcga cctttggatc 28920
ttagctgtcc cctccctgcg ttcgcactta acctttttca ccattattat tattattgtt 28980
attattatta tttttgagg gagtctcgcc ctgtcgccca ggctggagtg taatggcgcc 29040
ttcttggctc actgcaacct ccgcctcccg ggttcaggcg attctccgac ctcagcctcc 29100
caagtacgtg ggattacagg caccgccac cacgcacggc taatttttg tatcttttag 29160
tagagacggg gtttcaccat gttggtcagg ctggtctcca attcctgacc tcgtgatccg 29220
cccgcctcgg cctgccaaac agctgtgatt ataggcgtga gccaccgcgc ccggccaacc 29280
atcattatta tttttaacgg taaggatggt cagattttac taatgaagaa gagattataa 29340
aatcttcaag tctttatatc cacttgcttt ttgaggggtg gagtgggaag aaggttatgt 29400
aattcatacg ttcttcagag atgtgacaaa cattcacgga gccggacgac gtcgggttgg 29460
attcgcactg gagctgcaga tgggtgccag gatggactgg tccctaccct ccgcttgaac 29520
ctaggaggcg gaggttgcag tgaaccgaga tcgtgccact gcactccagc ctgggtgaca 29580
gagatactcc gtctcaaaaa aaaaaacaaa acaaaaaaca agcggactgg gcgcagtgcc 29640
tcaccctgta atcccagcac tttgcaaagc caaggcggga ggatcctttg agtttaggag 29700
tttgagacca acctgcgcaa cacagtaaga ccccgtctct acaaaaaata cagaaattag 29760
ccaggtgtgg tggtgtgcgc ctatagtccc agctattctg gaggctgagg tgggaggatt 29820
gcttattctg gaggcagagg ttgcactgag ccgaaatcaa gctactacac tccatccagg 29880
gcaacatacg agaccctgt ctcaaacaaa caaacaaaaa attgctcagt acctggccaa 29940
aaaagaagag gctcactatg cagaggggaa gtggaaggag atgtttggac ttctaaactc 30000
aatagagcag gagaggcaaa tgtagaatgt gctcaggaaa tatctgtgag atgaatgaac 30060
ttgagggaag taaggtacta gatattacct gccctaccca gaacaaatcc tgtgcaatgt 30120
ttccttgaaa agtgagaagt ctggaagggg tggctactga catagtgaag caactagttc 30180
aattctacaa cttgacagct accctgtgcc aggctatcta cgaggatact tagaatgcat 30240
aagacattcc ttcaaggaac tccaggaaca gaggcctgac atgttgcaat gtttagtgtc 30300
aagcagtgta ctagagacac attatcacac tcaaacctca caacaattct gtgaggtagg 30360
agttatcact cccctttat agatgaaaca gaggcttaga gtgattgatt tattgaaagt 30420
caaacagcca gtaaatggtg tagccaggat tccaaacttg ctgtctcact gagactgtac 30480
ttaattactg gagggaccgg gtgtggtggc tcattgctat aatcccaaca ccttgggagg 30540
ctgaggctgg tggatcacct gaggtcaggg gttcgagacc agcctggcca acatggtgaa 30600
accccatctc tactaaaaat acaaaaatta gctgggcatg gtggtgggct cctgtaatcc 30660
cagctactca ggaggctgag gcagggcaat tgcttgagcc gagatcacac tgcactccag 30720
cctgggcaac agggcaagac tctgtctcaa aaccaaaaaa aaaaaaatta ctggaggaac 30780
ctagaagaag aaatgatcaa ttttgcttgg agtgtatcta gaaagacttc actgagatca 30840
tttaaagaac aaaaaggatg gctggggtcc aggcagtggc tcatgcctgt aatcccagca 30900
ctttcggata ccaaggcagc agatcacctg aggtccagag tttcagacca gcctggccaa 30960
catagtgaaa ccccatctct actaaaaata aaaaaattag ctgagcatgt ggaggcac 31020
ctgtaatccc agctacttgg gaggctgagg caggagaatc actcgaaccc aggaggtgga 31080
```

                                                 51

```
ggttgcagtg agccaagatc acgccactgc actccagcct gggcaacaga gtgagactct 31140
gtctcaaaaa acaacaacaa caaaaaatac aaacaagaga caagtagttc ccaggtgcct 31200
accaagtggt caggcactgc acttacctca ctgactgcag taaccaccct ttgaggttgt 31260
ggcattgctc cattttccag gcaaggaaat gggctgagag ctgggattag tcaggtcatg 31320
actgtgtgtg ccactcccgc taaatctcat ttgatgtggt tcatgaggcc acaccatgga 31380
cagcttcctc cttgtgtcca ctgaggatat ggctttgtac aacactttgg tttttgaacg 31440
actttacaaa cctccctgtc ttgtgaggaa ggaagaacag ttattaccat ctgcatctga 31500
tgatgaaaca agggacgctg cagaggagcc gcactgacca ctccctccct ccagtcctgt 31560
catcccactg ccagtgtccc accctcttgt gccctgcact tcactggcta ataacccccc 31620
tcactttttc ctctgtgaag ccatcctgga taattcccca cccacgaatg gtccctcctc 31680
atctcagaga gctctccatg cacacctgtt accgtttctg tctttatctg taaatatctg 31740
tgtgtctgac ttccatgcct cacacacctc tatagggcaa agactgtctt aaacatcttg 31800
gtagtgtcag tattttgcac agtgaagttt ttttttttaa attatatcag ctttatttgt 31860
acctttttga catttctatc aaaaaagaag tgtgcctgct gtggttccca tcctctggga 31920
tttaggagcc tctaccccat tctccatgca aatctgtgtt ctaggctctt cctaaagttg 31980
tcacccatac atgccctcca gagtttttata gggcatataa tctgtaacag atgagaggaa 32040
gccaattgcc ctttagaaat atggctgtga ttgcctcact tcctgtgtca tgtgacgctc 32100
ctagtcatca catgacccat ccacatcggg aagccggaat tacttgcagg gctaacctag 32160
tgcctatagc taaggcaggt acctgcatcc ttgttttgt ttagtggatc ctctatcctt 32220
cagagactct ggaacccctg tggtcttctc ttcatctaat gaccctgagg ggatggagtt 32280
ttcaagtcct tccagagagg taagagagag agctcccaat cagcattgtc acagtgcttc 32340
tggaatcctg gcactggaat ttaatgaatg acagactctc tttgaatcca gggccatcat 32400
ggctctttga gcaaggcaca gatggaggga ggggtcgaag ttgaaatggg tgggaagagt 32460
ggtgggggagc atcctgattt ggggtgggca gagagttgtc atcagaaggg ttgcagggag 32520
agctgcaccc aggtttctgt gggccttgtc ctaatgaatg tgggagaccg ggccatgggc 32580
acccaaaggc agctaagccc tgcccaggag agtagttgag gggtggagag gggcttgctt 32640
ttcagtcatt cctcattctg tcctcaggaa tgtcccaagc ctttgagtag ggtaagcatc 32700
atggctggca gcctcacagg attgcttcta cttcaggcag tgtcgtgggc atcaggtgag 32760
tgagtcaagg cagtggggag gtagcacaga gcctcccttc tgcctcatag tcctttggta 32820
gccttccagt aagctggtgg tagactttta gtaggtgctc aataaatcct tttgagtgac 32880
tgagaccaac tttgggggtga ggattttgtt tttttttctt tgaaacagag tcttactctg 32940
ttgcctgggc tggagtgcag tggtgcaatt ttggctcatt ccaacctctg cctcccagat 33000
tcaagcgatt ctcttgcttc agcttcccag gtagctggga ttacaggcgg ccaccactac 33060
gcccagctaa ttttttgtatt tttagtagag acgggggtttc accatgctgg caaggcaggt 33120
ctcaaactcc tcacctcagg tgatccgccc acctcggcct cctaaagtgc taggattaca 33180
ggtgtgagcc cctgcgcccg gccaaggggt gaggaatttt gaaaccgtgt tcagtctctc 33240
ctagcagatg tgtccattct ccatgtcttc atcagacctc actctgcttg tactccctcc 33300
ctcccaggtg cccgcccctg catccctaaa agcttcggct acagctcggt ggtgtgtgtc 33360
tgcaatgcca catactgtga ctcctttgac cccccgacct ttcctgccct tggtaccttc 33420
agccgctatg agagtacacg cagtgggcga cggatggagc tgagtatggg gcccatccag 33480
gctaatcaca cgggcacagg taaccattac acccctcacc ccctgggcca ggctgggtcc 33540
tcctagaggt aaatggtgtc agtgatcacc atggagtttc ccgctgggta ctgataccct 33600
tattccctgt ggatgtcctc aggcctgcta ctgaccctgc agccagaaca gaagttccag 33660
aaagtgaagg gatttggagg ggccatgaca gatgctgctg ctctcaacat ccttgccctg 33720
tcaccccctg cccaaaattt gctacttaaa tcgtacttct ctgaagaagg tgaggaggaa 33780
ggggacaaga tgacatagag ccattgaaac ttttcgtttt tcttttcttt ttttaaaatt 33840
tttttgaggc agaatctcac tctgcccatt ctgtcggcga gacaggagtg cagtggtgtg 33900
atctcccctc acagcaacct ctgcctccca ggctatagtg attctcctgc ctcagcctcc 33960
tgagtagctg gaattatagg cgtgcgccac taccacctgg ctaatttttg tatttttagt 34020
agagacaggg tttcatcatg ttgaccaggc tagtcttaaa ctcctgacct caaatgatat 34080
acctgccttg gcctcccgaa gtgctggaat tacaagtgtg agccaccgag cccagcagac 34140
acttttcttt tttctttttt ttttttttgag acagagtctc gcactgtcac ccaggctgga 34200
gtgcagtggc acaatctcag ctcactgcaa cctccacctc ccgggttcag gtgattctcc 34260
tgtctcagcc tctcgagtac ctgggattac aggtgcctgc caccacgccc ggctaatttt 34320
ttgtattttt agtagagaca gggtttcact atgttggcca ggatgattgc gaactcctga 34380
cctcgtgatc tgcccacatc ggcctcccaa agtgctggga ttacatgcgt gagccactga 34440
cacttttctt tgcccttttct ttggaccctg acttctgccc atccctgaca tttggttcct 34500
gttttaatgc cctgtgaaat aagatttcgc cgcctatcat ctgctaactg ctacggactc 34560
aggctcagaa aggcctgcgc ttcacccagg tgccagcctc cacaggttcc aacccaggag 34620
cccaagttcc ctttggccct gactcagaca ctattaggac tggcaagtga taagcagagt 34680
cccatactct cctattgact cggactacca tatcttgatc atccttttct gtaggaatcg 34740
```

```
gatataacat catccgggta cccatggcca gctgtgactt ctccatccgc acctacacct 34800
atgcagacac ccctgatgat ttccagttgc acaacttcag cctcccagag gaagatacca 34860
agctcaaggt aggcattcta gctttttcag gccctgaggg ccctgatgtc tgggggttga 34920
gaaactgtag ggtaggtctg cttgtacaga cattttgtcc cctgctgttt tgtcctgggg 34980
gtgggagggt ggaggctaat ggctgaaccg gatgcactgg ttgggctagt atgtgttcca 35040
actctgggtg cttctctctt cactaccttt gtctctagat acccctgatt caccgagccc 35100
tgcagttggc ccagcgtccc gtttcactcc ttgccagccc ctggacatca cccacttggc 35160
tcaagaccaa tggagcggtg aatgggaagg ggtcactcaa gggacagccc ggagacatct 35220
accaccagac ctgggccaga tactttgtga agtaagggat cagcaaggat gtgggatcag 35280
gactggcctc ccatttagcc atgctgatct gtgtcccaac cctcaaccta gttccacttc 35340
cagatctgcc tgtcctcagc tcacctttct accttctggg cctttcagcc ttgggcctgt 35400
caatcttgcc cactccatca ggcttcctgt tctctcggtc tggcccactt tcttttttatt 35460
tttcttcttt ttttttttttt tgagaaggag tctctctctc tgtcacccag gctggagtgc 35520
tgtggcgcca tcttcactca ctgtaacctc tgcctcctga gttcaagcaa ttctcctgcc 35580
tcagccttcc aagtagctgg gattataggc gcctgccacc aggcccagct gattttttcta 35640
ttttttagtag agacggggtt tcgccaggct gttctcgaac tcctgaactc aagtgatcca 35700
cctgcctcgg cttcccaaag tgctgggatt acagtgtgag ccaccacacc cagctggtct 35760
ggtccacttt cttggccgga tcattcatga cctttctctt gccaggttcc tggatgccta 35820
tgctgagcac aagttacagt tctgggcagt gacagctgaa aatgagcctt ctgctgggct 35880
gttgagtgga tacccccttcc agtgcctggg cttcacccct gaacatcagc gagacttcat 35940
tgcccgtgac ctaggtccta ccctcgccaa cagtactcac cacaatgtcc gcctactcat 36000
gctggatgac caacgcttgc tgctgcccca ctgggcaaag gtggtaaggc ctggacctcc 36060
atggtgctcc agtgaccttc aaatccagca tccaaatgac tggctcccaa acttagagcg 36120
atttctctac ccaactatgg attcctagag caccattccc ctggacctcc agggtgccat 36180
ggatcccaca gttgtcgctt gaaaccttc taggggctgg gcgaggtggc tcactcatgc 36240
aaacccagca ctttgggaag ccgaggcggg tgatcacctg aggtcaggag tttaagacca 36300
ccctggccaa cgtgttgaaa ccctgtgtct actaaaatac aaaaaaaaaa aattatctgg 36360
gcatgatggt gggtgtctgt aatcccagct actcaggagg ctgagaaggg agaatcagtt 36420
gaacccggga gatggtggtt gcggtgagcc gagatcgcgc cactgcactc cagcctggga 36480
ggctgagcga gactccatct cgaaacaaaa caaaacaaaa ctatctaggc tgggggtggt 36540
ggttcatgta tgtatgtgta tatacatata tatgtgttta tatgtatata tatatacaca 36600
cacacacata catacacaca catacacaca caaattagct gggtgtggca cccgtgtagt 36660
cccagctact caggaggcta atgtgggagg atcagttgac cctaggaagt caaggctgca 36720
gtgagtcgtg attgcgccac tgtactccag cccgagtgac agagtgacat cctgtctcaa 36780
aaacaaaaaa aaatctcccc aaacctctct agttgcattc ttcccgtcac ccaactccag 36840
gattcctaca acaggaacta gaagttccag aagcctgtgt gcaaggtcca ggatcagttg 36900
ctcttccttt gcaggtactg acagacccag aagcagctaa atatgttcat ggcattgctg 36960
tacattggta cctggacttt ctggctccag ccaaagccac cctaggggag acacaccgcc 37020
tgttccccaa caccatgctc tttgcctcag aggcctgtgt gggctccaag ttctgggagc 37080
agagtgtgcg gctaggctcc tgggatcgag ggatgcagta cagccacagc atcatcacgg 37140
taagccaccc cagtctccct tcctgcaaag cagacctcag acctcttact agtttcacca 37200
aagactgaca gaagcccttc ctgtccagct ttccccagct agcctgccct tttgagcaac 37260
tctggggaac catgattccc tatcttccct ttccttcaca ggtctgcaca cctcattgcc 37320
ccttttgcaa ctactgaggc acttgcagct gcctcagact tctcagctcc ccttgagatg 37380
cctggatctt cacaccccca actccttagc tactaaggaa tgtgcccctc acagggctga 37440
cctacccaca gctgcctctc ccacatgtga cccttaccta cactctctgg ggaccccag 37500
tgttgagcct ttgtctcttt gcctttgtcc ttaccctaga acctcctgta ccatgtggtc 37560
ggctggaccg actggaacct tgccctgaac cccgaaggag gacccaattg ggtgcgtaac 37620
tttgtcgaca gtcccatcat tgtagacatc accaaggaca cgttttacaa acagcccatg 37680
ttctaccacc ttggccactt caggtgagtg gagggcgggc accccattc cataccaggc 37740
ctatcatctc ctacatcgga tggcttacat cactctacac cacgagggag caggaaggtg 37800
ttcagggtgg aacctcggaa gaggcacacc catcccttt tgcaccatgg aggcaggaag 37860
tgactaggta gcaacagaaa accccaatgc ctgaggctgg actgcgatgc agaaaagcag 37920
ggtcagtgcc cagcagcatg gctccaggcc tagagagcca gggcagagcc tctgcaggag 37980
ttatggggtg ggtccgtggg tgggtgactt cttagatgag ggtttcatgg gaggtacccc 38040
gagggactct gaccatctgt tcccacattc agcaagttca ttcctgaggg ctcccagaga 38100
gtgggctgg ttgccagtca gaagaacgac ctggacgcag tggcactgat gcatcccgat 38160
ggctctgctg ttgtggtcgt gctaaaccgg tgagggcaat ggtgaggtct gggaagtggg 38220
ctgaagacag cgttgggggc cttggcagga tcacactctc agcttctcct ccctgctccc 38280
tagctcctct aaggatgtgc ctcttaccat caaggatcct gctgtgggct tcctggagac 38340
aatctcacct ggctactcca ttcacaccta cctgtggcgt cgccagtgat ggagcagata 38400
```

53

```
ctcaaggagg cactgggctc agcctgggca ttaaagggac agagtcagct cacacgctgt 38460
ctgtgactaa agagggcaca gcagggccag tgtgagctta cagcgacgta agcccagggg 38520
caatggtttg ggtgactcac tttcccctct aggtggtgcc aggggctgga ggcccctaga 38580
aaaagatcag taagccccag tgtcccccca gcccccatgc ttatgtgaac atgcgctgtg 38640
tgctgcttgc tttggaaact gggcctgggt ccaggcctag ggtgagctca ctgtccgtac 38700
aaacacaaga tcagggctga gggtaaggaa aagaagagac taggaaagct gggcccaaaa 38760
ctggagactg tttgtctttc ctggagatgc agaactgggc ccgtggagca gcagtgtcag 38820
catcagggcg gaagccttaa agcagcagcg ggtgtgccca ggcacccaga tgattcctat 38880
ggcaccagcc aggaaaaatg gcagctctta aaggagaaaa tgtttgagcc cagtcagtgt 38940
gagtggcttt attctgggtg gcagcacccc gtgtccggct gtaccaacaa cgaggaggca 39000
cgggggcctc tggaatgcat gagagtagaa aaaccagtct tgggagcgtg aggacaaatc 39060
attcctcttc atcctcctca gccatgccca gggtccgggt gcctggggcc cgagcaggcg 39120
ttgcccgctg gatggagaca atgccgctga gcaaggcgta gcccaccatg gctgccagtc 39180
ctgccagcac agataggatc tggttccggc gccggtatgg ctcctcctca gtctctgggc 39240
ctgctggtgt ctggcgttgc ggtggtacct cagctgaggg tcaaggaagg aaggtgtgtt 39300
aggagaacta gttcttggat ccctgcccac tctccccagg gctgcccctc ccatctgccc 39360
cttacctcca tcccagggga agtagagact gagaatgtgg gtacaatagg cacagaggtt 39420
gtgcagccca cgcaggtgga cctgcagctt cccactgggc agctttgcct gcagcagcag 39480
ggccaagtag ctgaagacga aggcgtccaa ggaggcaggg ctggagcaga gagagaaggg 39540
tgggatggag gagaaccact ggggtagaag gggtaaagat ggagctggag gaagagtcag 39600
ccttgggagg tgggctctgg gcagcaggcg gccaccaggg aaggacagga cacacagttc 39660
tagacctggt atggggagag atccccaggt ggcgccagct ggccctgaat agggctctat 39720
cccagggctg cataaagggc acactcagtg ccccacagct cttcaggccc ttcctgtgcc 39780
tggctgccct cccaccctac cctttgtac ctctgagaag gctctggccc cacgcacagc 39840
cccactgtca ccagggccag tatctgtctc agggacctcc tatccagagc ctgagccagc 39900
cccagcccca gccccagctc cagctgctcc atctgaacct gtatcttctt ccaagccacc 39960
cattaccctc ttggagtcag actcacgcat ctccaaagaa gaactttttga gagcccaggc 40020
gctgagagag cagggtcaga cactcccgag cctctcggta cagctgtagg ggcgacacag 40080
gtaggcttgc agctgcggga acagtgccac ctccgcacct aagcactccc attcctggcc 40140
agcatccttg gggctcatct catacaatag cccccggtct cagagctacc tccttctcca 40200
gctcttcctc gtcctcaggc ctgtgctccc cagtcagcag ctgtagccgt tccatgtact 40260
gccgctgcat gcggccaggc aggaagaagt tgaggggaaa gggcatagcc tctgcatacc 40320
acttccgggt cacttctacg tagttcttgg tgtctatcca aaaagtatgt acctggattg 40380
ggtgggcagg aagaaacagg caggtctgag ccagtgcacc tgtctgattc aaggtgggct 40440
tctgacctcc atgctctcct gagtctctgt gtgggtctgt gtgttcccgt cccctccccg 40500
gctggccatg gatgctggga ggtctgggca cactcaccag caccgggatc aacttctcct 40560
ccaggagaga catgaaggcc agggtgtctg ccccttgctg agctgacaga tcataatcag 40620
cattgtactt ctgtggagga aatatccatg gcgtggacgc tggggagctg caagggcact 40680
tcaccaggga ggaaggagtc ctgtctggta ccccctcac tggcctctga gtgcagtgga 40740
ggtacagcaa ggaacttttc ctgccaaggc ccccttgcct gggcccagcc agtagcctgt 40800
tgctgttggc aaaaagcctg ggccttggag cccgctggcc gtcaaggtcc tgggcccatt 40860
gagaagaagg aagaaaggtt gggccgcaaa ctaggagcag ctcccagaat ttccatggaa 40920
agctggaaca atgcctgctg acagcaactt tctaacagta actttcccga cccagacacc 40980
acaaagctag cacaacggag ctcagatgca ggctaggact cggtccatgc ctcaggaacc 41040
agggaaagcc atcctcacac tccctggatc cagggaaccc acgcccaggg ccccccagct 41100
tgttccctca gtgcccagct cttggctatt tctttcactt cattccatcg cccagacacc 41160
attaccacat acacattcca tccatacccc caggtctcag cctgccctac cttcccaggc 41220
tccagtccct gttcctcagc atcccccacc acatcctgag taagctttgt ccccagataa 41280
cctcttcagc atgatcctta aatctcccta agcctcagtt tctcccctgt ggaatggggg 41340
taagaatctc tttctctgaa tgccctgtg ttaggaaata atttagaata cttcggaaac 41400
aaaaagctct gttcacacct aagcaatcag ggcagtggcc tggccttgcc aggaacttag 41460
gcttttatct ggatcctctt tccaggcctc tcaattaatt ccccaggtcc ttaacctttg 41520
ggaaattaga aattaggaag agtgtcccac ttctgacact gtgttccctc ttggaacctg 41580
accgtcaatg ctagaagaac ccttggaaaa catgctggcc agccctcta gttttacaaa 41640
taagggagtg cacagccctg agaggttaca tggcctgccc aagatcacgc agtcaatggc 41700
agagtaaaga gcatagccta ggcctcccca ctcctctagt aatgctcttt catcttctcc 41760
aacctggctc taagccttgt ccatcctgag ccccatatct agcccaacct agtccctgaa 41820
aacaagaagt ggcccttaga aatctctctc cagtcccact atcagaggcc aactgctgtc 41880
ttccagtctc cttcagcctg tgctcctctc cctccctgac tgacaggcag aaggtaccgt 41940
gcctctggat atccccacag tgccctgagc tgcatctctt gccgactgct ttaatacatc 42000
acagtgacat tgtgtgtgtc tctgccacca gactattgct ccttgatgct ctgggtcacc 42060
```

54

```
tgcatctagc atggcatata tctagtgctc aataaatgtg tattgtacgg aattgactga 42120
acttctctca ctggcagccc cctctatcca aatcacccac ctcttttga aggtgggtga 42180
tgatcttgtg tggtactgag gtgacctctc catgactggt ccaaagggca ggcagggttc 42240
ctgatactga gagaaaagta taccaaccag gaccttagct gcctatccat acgtagttgc 42300
aacacattcc tgcctatctc ctgcttctcc tcttgtacac acccttcctc acccccaagg 42360
gatactgggt acctgaaggg ctctgccagg ggttgctgat cttgtgctat atggtgcaca 42420
agaaactttt aagaaaaaag aaactttcaa gacacacttt ccaaccacga attctatctc 42480
tgctcctttt catagcaata ggttttcttt ttcttccctc cacacttaaa catccattct 42540
cttatcaccc accccatca gactccttcc cctgtgtttc ttcagccact gctctgacca 42600
aaatttgagt gaccaaaagt ggtgtcagac ccagtgacca tttctctgcc tgcatttcac 42660
ttgaccttga agcagcaatt aatctccata atcagcatct tcttgaattt ttccctttga 42720
ggacattgct cttctacttt gtgctctggt tatcctttac aaacttttac acctctcctg 42780
aactggttaa cagtagaggg ccccaagggt ctcacgtaag ccttctttgt ttttgttttt 42840
tttctttttct tttatttttt atatattttt ttgagacgga gtcttgctct gttgcccggg 42900
ctggagtgca gttgcacgat ctcggctcac tgcaagctct gcctcccagg ttcatgctat 42960
tctcctgcct cagcctcccg agtagctggg actacaggtg cctgccacca tgcctggcta 43020
attttctgta tttttaacag agacagggat acaccatgtt agccaggatg gtctcgatct 43080
cctgacctcg tgatctgccc acctcagcct cccaaaatgc tgggattaca ggcgtgagcc 43140
actgctccca gccgtcattt ttattttatt ttatttattt ttttgagatg gagtcttgct 43200
cttttgccag gctggagtgc atggtgcgat ctcggctcat tgcaaccccc gcctcccagg 43260
ttcaagcgat tctcctgcct cagcctcctg agtggctggg actacaggtg cctgtcacca 43320
tgcctggcta attttctgta ttttagcttg agacacggtt ttcaccttgt tagccaggat 43380
ggtctcgatc tgtgagcctc gtgatctgcc tgcgtcggcc tcccaaagtg ctgggattag 43440
caggcagtga gccactgcac ccggccatca attttttttt tttttaaatg gagtcttgct 43500
ctgtcaccca ggttggagtg taacagtgca atcttggctc attgcaacct ccgcctcttg 43560
ggttcaagcg attctccagc ctcagcctcc tgagtagctg ggactacagg tgcatgccac 43620
cacacccggc tagttttttgt atttttagta gagacggggt ttcaccatgt tgtccaggat 43680
ggtctcaaac tcctgacctc aaatgatgtg cctgccttga ccttccaaag tgctgggatt 43740
agaggcgtga accacattgc ccaccgtaag ccctcttttc tacttccact ctttctgtag 43800
gtggccctac tactaacgtc catggcttta agtaccatct ttctatgtgt taatgcataa 43860
gtccagcctt gacctctctt gagcgccatc caactcagca tatctggttg gatgtctaat 43920
gagtatttca aattcaacat ggccacaact gaactaactg aactcttttt ttttttaggg 43980
cagagttttg ctcttgttgc ccaggctgga gtgcaatggc gagatcttgg ctcactgcaa 44040
cctctgcctc cagggttcaa gcgattctcc tgcctcagcc tcccgagtag atgggattat 44100
aggccccgct acccggctaa tgttttgta tttttagtag agacagggtg ttgccatatt 44160
gaccaggctg gtctgcaaat cctgacctca ggtgatcccc ctgcctcggc tcccaaagt 44220
gctggaatta caggcgtgag tcactgcccc ggccacacaa ctgagctctt cattcccacc 44280
ccagcaccgg ttattttttcc actgttccca tctcaatggc acctccatta cccatttgca 44340
cattccaaaa gcccaggaac catggtgact tcttttccca tatccaacac aaccaatcct 44400
atcttgaatt catccacgtc ccaccacctc cccagctacc tagttccagc caccctctct 44460
ccacaacctc tgaatcaatc tttcactttt cccagcaatc cattctccac tcagcaaaat 44520
gatgataaag cacgtcacat caaggctctg cctcaattta atggcttccc attgtattta 44580
gaatcatctc caagctctca gagactatgg tcagctacaa tctggcccac cttctgttcc 44640
agccaaattt cctcacagca caaggacgtt tgcacctgct attttccaag cacgaaaccc 44700
tcgggcagat atatctggtg ctgtcaccta atttcaggtt ttaactccac tctcaccatt 44760
tcagtgagga cctaatcccc atcgcagtca ttctatcaca tagctttatt ttattttatt 44820
ttattttttt ttgagataca gtctggctct ctcacccagg ctggagtgca gtggtgtgat 44880
ctgggctcac tgcaaacttc catctcctgc gttcaagcga ttctcctgcc tcagcttccc 44940
gagtagctgg gattacaggt gtctgccatc acgcctgact aagttttgta ttttcagtag 45000
agacggggtt ttgccatgtt agccaggctg gtctcgaact ccttgacctc aagtgatcca 45060
cctgcctcag cctcccacaa tgttggattt acaggcgtga gccactgctc ccggccacat 45120
agccatgttt taagcatgta tcactatcta aaattatttt ttgtttatac gtttgtgtcg 45180
tcctgtagaa tgtaaggtca caagatcagg gacttgctca ttgcactggg tctaacacac 45240
agtgcttcaa caaacactcg ttaagatact aacgtggcag agtgggggcct tgtaaacagt 45300
ttcaggaccc tgtgcttgta agagcaacgt ggtgccctcc caaggaagac agggaggatg 45360
caggagcact gcccagagat ggcgtcaggc tgcaagacat cttgaataat tcaccatcgt 45420
aacaacccag cctcaggaag agatggggca aggccagaac gaaacattag gtaagaggcg 45480
gtggacaatg ggattcccac agggcagctt ttgggcactg gacgttccct aacctgaggc 45540
tctctgaaga ggaaggttag gaatcctctc agcttcggtg ggctggactc actgtgggaa 45600
ttcaatcgcc ccccccacc cactaagggt gtgctggcgg gaaagcgctg agacgcatgc 45660
gtagttctcg cgtctggcac ccgctccctt tccaatacgc ttgcgccccg tctgtgctac 45720
```

```
ggatggtcag ggagagttgt ccgtcttcaa atggaccaat gagacttgtg gaggggctct 45780
gagtcccgcc tctggatgag tgaccgtctc ttttccaagt gaggcccgcc cgcctcccca 45840
gggctgcttt tctcgcggca cgggtggtgg ggctgcttct tgacttccgc gcctagtgcg 45900
cagggcccca ttctccagtc ccgcccacgc gcctttggag gctgcggtgg gatttccttt 45960
tgccttcggt tggggctgct gtttctcttc gccgacggta ggcattataa atatttcgcc 46020
ctttgaattt tagctctccc ctcccggcgt tcgcacttag cctttttcat cattatcatt 46080
attttttaatg gtaaggatgg tcaaatttta ctaatgaagc gattataaaa tcttcaagtc 46140
tttgtatcca cttgcttttt gagggctgga gtgggaagaa aggtatataa ttcattcatt 46200
cttcggacat gtgacaaacg ttcacggagc gcggcaacga gcgccggtgt cgcgatgcgc 46260
actggggctg cacatgggag ccaggatgga ctggactggt ccctgccctg cccgctgacg 46320
attggcaggc cactgccttt gatgagctgg gcgctataac tgccattaag ccatttgtac 46380
aattaatcac aacagtgata agagcgacaa aggagctatt cgggtggctg aggcggagga 46440
tcttttgagc ctaggagttc gagaccagcc tggggaatag agcgagatcc tgtctcaaaa 46500
aaagggggag aaaaagtgac aaagaagttg tgagggctat gagtttgcgt tagaggaggt 46560
gtgtgaggtg gggaggcggc aggggcgcg gttgttctta gagaaagtga catccgggct 46620
aattttgaaa gaataagtgt taactaggct aagcggtggg aaagagtagt gtgtgctgaa 46680
ggaagggaag aggaacctgg caagttcatg gcaggcctgt aattggatgc tggtctccct 46740
ccacacttga ctcctacagt ctgatttcta cacagcaccc aaagtgatct cttaaaaata 46800
cacatgtgat cttgtcactt cccagcacca aactctacag tgaatttcca tcttagaaca 46860
aaattcagac tccttaccat ggccaccaag accctacaca atctggcctc ccaatttcct 46920
tttccaaggt caccttttac cactatccat ctcactcaca ctgctccagc actctctatg 46980
ctttttatttt tctttcttcc tctttcttc tttctttctt tttcttttttc tttctttctt 47040
tccttccttc tctctctctc tctttctttt cttttctctt tctttttttt tttttttgaga 47100
tgcagtcttg ctctgtcacc caggtgtgtg atcttggctc actgtcaacc cagagcagtg 47160
ggggtgatct tggctcactg cagcctccgc cttccaggtt caagcaattc tgcctcagcc 47220
tcctgagtag cagggattag cgccatcagt cccagctaat ttttgtattt ttagtagaga 47280
tttcatcatg ttgtccaggc tggtctcgaa ctcctgactt caagtgatct gcccatctca 47340
gcctcctaaa gtgctgagat tacaggcagg agccaccaca cctggctcag tatttgtttt 47400
attttttgttg tgtttatttta tttagagaca aggtcttgct ctgttgctca ggctggagtg 47460
ctgtggcagg aacacagctc actgcagcct ccactacctc aattcaggcg atcctcccac 47520
ctcagctgag actacaggtg tgcatcacca tgcctggtta atttttttcgt tttaccatgt 47580
tggccaggtt tgtctcgaac tcttgggctc tgctgtcctc ctaccttagc ctcccaaagt 47640
gctaggattg taggcgtgag ccactgtgcc cagctggtgt tcagtatttg aatccatatt 47700
tcctgtagcc gcaaccaaag ttccactgtt aggtctcact ttgactttaa taattgtgtt 47760
caggctgggc acactggctc aagcctgtaa tctcagcagt ttgggaggcc gaggtggggtg 47820
gatcacatga ggtcaggtgt ttgagaccag cctgtccaac atggcgaaac cctgtctcta 47880
ctaaaaatac aaaacattct ccgatcgtag tggcgggcgc ctgtaatccc agctacttgg 47940
gaggctgaag gaggagaatt gcttgaacct gggaggcaga ggttgcagtg agcggagatc 48000
acgtcattgc actccagcct gggctacaga gcgagactct gtctcaataa gtaaataaat 48060
aaataaataa ataaataaat aaataaataa ttgtgttcgg agtcagcatc attcttcctg 48120
aagttcacca ctcctttgcc aagaacactt cctgaaacac tgacaagcag gaccttgaat 48180
aatggggtat ggttggtaac aactcactca ttcaacaaac attgagcacc tattttgtgc 48240
ttgcctctaa atgaagagct ggttgtatta tttatttttt taggtgacag ggctttccct 48300
atgttgccca ggttcgtctc aaactcctgg gctcaaaaga tcctcatctt ctcaagtggt 48360
tgaatataca cgctccagcg accatgcctg gctgaatgaa gagctttgag attttgaaga 48420
aacaggaacc atgaaatttg ctttgcaact gtttgcaacc tttaaggaag actgaaaagg 48480
cattcctgaa gcatgtgaga agcagtctgt gtgacctgat gactcagaac tgcttggaat 48540
ttagattagg acagatatga gcttaggctt cactctgcca catatttaac ttctctaagt 48600
cttagttttc ttttcttttt tttttttttt gagatggagt ctcgctctgt cacccaggct 48660
ggagtgcagt ggcacgatct tggctcactg caagctccgc ctcccgggtt cacgccatcc 48720
tcctgcctca gccacccgag tagcggggac tacagtcgca caggccacg cctggctaaa 48780
tttttgtatt tttagtagag acgggtttca ccgtgttagc caggatggtc tcgatctcct 48840
aaccttgtga tccgcccgct tcggcctccc aaagtgttgg gattacaggt gtgagccatc 48900
gcgtctggcc tctaagtctt aattttctta tctgtaatgt agagttgtca ggctagtgca 48960
tgtaataagc actcatgaaa gactgactat tatcttgcga aaaattggaa gagatcatat 49020
gaggtacaag gaccttccat ctgcactggg ctgtacattg aatgttgtgg ttactgttga 49080
agcattggta aatcacatga atccaatggt aaaaccacac cctaaggtca gactcagtgg 49140
ctcacgcctg taattccagc acttttggaa accaaggcaa gaggattgct tgagctcagg 49200
agttcgatac cagtctaggc aacctgtttc tataaaaagt taaaaaatta gcttggtgtg 49260
gtggtgtgca cttctggtcc cagctactca ggaggctaag gtgggaggat cccttgagcc 49320
caggtggtcg aggctgcagt gagccaggat cacaccattg cattccagcc tggatgacag 49380
```

56

```
tgtgaggccc tgtcttaaaa aagacaaaaa caaaccaaaa aaacccacac cctagtgggt 49440
aaggggcagc agaggtccca cccaagagtg aaatcatttt tggtgtcagt aatcagggag 49500
agtaatatac cctcaggcca gaaactagag gtgagtgatg gctcacgcct ataatcccag 49560
caccttggga ggctgaggca ggtggattgc ttgacctcag gaattcgaga ccagcctggg 49620
caacatagga agaccccatc tctaaaaata aatttcaaaa attagttggg catggtggca 49680
tgtacctgta gtcccagcta ctatggaggc tgaggtggga ggatccaatt gagcctgaga 49740
ggtcaaagct gcagtgaatt gtgattgtgc caagaccctg tctctaaaat aaaataaaat 49800
tacaattaaa aactagagct gaaaggacag gttctaggtt aactggtagt agttgttcat 49860
tcatctgtat aaaaagtact ttttgagca cctactctgt gctgtgcatg gaatgaacaa 49920
atgtctttat ttgacttgaa cacagaccat agaagtaact aacagtggaa ctgggagtgg 49980
cactctccat gggacctaaa gacctaggag cctgtgatat gatacctgtc agtgtgaaag 50040
ggctggagtt tgctatctga gccagaccta cactccaaga caggtcttgc tgggatggga 50100
tcaaaattgc tgctgggtca gccgaactat ttttgtactt ctgcttttca cttatattta 50160
tgtcttccct aggtatatag ctgtcttttt ttgtttgctt gtttttctga gtcagagtct 50220
tgctctgtca ctcaggctgg agtgcagtgg cgcgtctcgg ctcactgcaa catccacctc 50280
gggttcaaac gattctcctg cctcagattc ccgagtagct aggattacag gtgcccacca 50340
ccatgcccgg ctaatttttt gtatttttaa tagagatggg gtttagtaga gacagggttc 50400
actgtgttat ccaggatggt ctccatctcc tgacctcgtg atctgcccgc ctcagcttcc 50460
caaagtgctg ggattacagg catgagccac tgcgcccggc cactggagac ccctttttcta 50520
ccaaaaaaaa taaaaataaa taaataaata tatatatata tttgtaaaga cggagttctc 50580
tatgttgccc aggctggtct tgaactcctg gcctcaaggg atcctcttgt ctcagcttct 50640
taaaatgatg gggttacagg catgagccac cgtaccaggc cttagcaaac tctttttcaa 50700
gtgctataca aaggggacag aggaacgtga ttgtggccac ctagtatgcc cctattggcc 50760
actgcagtga ggcctaggtg tttgaagaga ggcacctagg gtagtggctc tcaggcacac 50820
cctaggggca tttttggaaat ttgtggggca tctttaatag agacaatgat taggaggcac 50880
tttgagaatt tagtggatgg agcccaggaa aggtagacat tctgcaacat gtagtacatt 50940
catacacaag gaagaattca ctcatttcac ctgacttaca aatataaaat caaatataaa 51000
tcagtaggac tttattataa aatattgcag aaaagtttca caagaatttt ttgtagaaaa 51060
agcccaatca gggccgggca tggtggctca tgcctgtaat ctcaggactt tgggaggccg 51120
aggcgggtga atcacctgag gtcaggagtt tgggacaagc ctggccaaca tggtaaaacc 51180
ccgtcttgac taaaaataca aaaatcagcc aggcatggtg gtgtgcgtct gtaatcccag 51240
gtactcggga ggctgaggca ggagaatcgc ttgaacccag gaggcggggt ttgcagtgag 51300
ccaagatcaa gccactgtgc tccagcctgg gtgaaagagc aagactccgt cgaaagaaag 51360
aaaggaaggg aggaagggag gaagggaggg agggagggag ggagggaaag aaagaaaaaa 51420
gagaagagag gggaggggag ggaagaggag aaaagaagga aggaaggcag gaaggaagga 51480
atccagtcga gatcgttaaa tttgttgtaa ttttgtcttt ggcacaataa acattagtcc 51540
ttattaaaac taactttact tagaaaataa aatagaaaat cctcaaggac aaatcacatt 51600
gtacaggaaa tatgaaatgt gaaataatat ccaccttgga aattttttt ttttgaaaca 51660
gagtgttact ctgtctccca ggctggagtg cagtggcaca atcttgggtc tctgcaacct 51720
ctgactcctg ggttcaagtg attctcgtac ctcagcttcc caagtagctg ggattacagg 51780
cgtgcaccac cacacccagc taattttttg attttcattt cagatgggat tttgccatgt 51840
tggccatgaa cacctgtcct caagctatcc actgcctcag cctcccaaag tgctgggatt 51900
ataggcatga gctaccgtgc ccagccaccc tggaaaaatt ttacaaaatg aagtataaaa 51960
agaagaaaag aggggcgggc atggtgcctt gtgcgtgtaa tcctagaact ctgcaaagcc 52020
gaggcaggag atcctttggg tttaggagtt tgagaccaac ctgcacaaca tagcaagacc 52080
ctatttctac aaaaaataca gacactaggc tgggcgtggt ggctcacgtg taatcccagc 52140
actttgggaa gctgaggcca gcagatcacg aggtcaggag atggagacca tcctggctaa 52200
catagtgaaa ccctgtctct actaaaaata caaaaaatta gccgggtgtg gtggcaggcg 52260
cctgtagtcc cagctactca ggaggctgag gcaggagaat ggcgtgaatc cgggaggcgg 52320
agcttgcagt gagccgagat cgtgccactg cactccagcc tgggagacag agcaagactc 52380
cgtctcaaaa aaaaaaaaat tttgctcagt acctggccaa aaaagaagca gctcactccc 52440
tgtacacaga ggggtaagag aaaggagatg gttgaacttc taaactcgct aaagcaggag 52500
aggcaaatgt ggaatgtgct caggaaatat ctgtgagatg aatgaatttg agggaagtaa 52560
ggtactagat aattacctgc cctacccaga acaaatcctg tgcaacgttt ccttgaagag 52620
caggaagtca ggccgggtgc tgtgctcacg cctgtaatcc cagccctttg ggaggccaaa 52680
gtgtgcgaat cacctgaggt caggagattg agaccagtct ggctaacatg gtgaaacccc 52740
atctctacta aaatacaaaa attagccggg cgtggtggt cgtgcctgta gtcccaacta 52800
cttgggaggc tgaggcagga gaattgcttg aacctgggag gcagaggttg cggtgagctg 52860
agatcggcca ctgcactcca gactgggtga cagagtgaga caacatctca aaaaacaaa 52920
aaaaaagag aaaagcagga agtctggaag gggtggctac tgacatagtg aagcaactag 52980
ttcaattcta caacttgaca actaccccctg tgccaggctg tctacaagga tatttagaat 53040
```

```
gtgtaagaca ttccttcaag gaactccagg aacagaggcc tgacatgttg caatgtttag 53100
tgtcaagcag tgtactagag acacattatc acactcaaac ctcacaacag ttctatgagg 53160
taggagttat cactcccctt ttatagatga aatagaggct tagagtgatt gatttactga 53220
aggtcaaaca gccagtaaat ggtgtagcaa ggattccaac cttgccgtct cactaaaact 53280
gtacaaaaaa agatacaaac aacagacaaa tagttcccag gcgcctccca agttgccagg 53340
cactgcattt acctcactga cccctttgag gttgtggcat tgcctccatt ttctaggtga 53400
ggaaataggc tgagagctgg ggttagtctg tcatgactg tgtgtgccac tcccaccaaa 53460
tctcatttga tgtggttcat gaggcaaatg gcatggacaa cttccttcac atgtcccacta 53520
agcatatggc cttttacaac actttctggt ttctgaacta ctttaaaacc tcactgtcct 53580
gtgaggaagg aagaacagtt attacaatct gcatctggaa gccaattgcc ctttagagat 53640
atggctgcaa ttgcctcact gcctgtgtca tgtgactctc cgaggccctt aatgagtaaa 53700
tgaggggtgc tgcaggggag ccaagctgac cactcccctc cctccagtcc tgccacccca 53760
ctgccagtgt cccaccctcc ttgcgcccta cacttcactg gctaataacc cccctcactt 53820
tttcctgtgt tgaaggcatc ctggataatt ccccacccac gaatggtccc tcctcatctc 53880
agagagctct ccatgcacac ctgttactgt ttctgttttt acctgtaaat atctgtgtct 53940
gacttccatg cttcatgcac ctctataggg caaagactgt gtcttaaaca tcacggtagc 54000
ctcagcatgt tgtgcaatga aggttttttt gttttgttc tttgtttttt ttttggtatt 54060
agctttattt gtatcatttt gaaatttta tcaaaaaagc agcgtgcctg ctgtggttcc 54120
catcctctgg gatttaggaa tctttacccg attctccatc caagtctgtc tttcgtattc 54180
taggctcttc ctaaagttgt cattcacata taccctccag aattttatag ggtgtataat 54240
ctgtaacaac tcggaggaag ccaattgccc tttagaaata tggctgcaat tgcctcactt 54300
cctgtgtcat gtgactctcc tagtcatcac atgacccatc cacattggga agccagaatt 54360
acttgcagga gtaacctagt gcctatagct atggcaggta tcctgcatcc ttgttttttg 54420
tttagtggat cctctatcct tcagagactc tggaacccct gtgctcttct cctcatctag 54480
tgaccctgag gtgatggagt tttcaagtcc ttccagagag gtaagagaga gagctcccaa 54540
tcagcattgt cacagtgctt ctggaatcct ggcactggaa tttaatgaat gacagactct 54600
ctttgaatcc agggccatca tggctctttg agcaaggcac agatggaggg aggggtcgaa 54660
gttgaaatgg gtgggaagag tggtggggag catcctgatt tggggtgggc agagagttgt 54720
catcagaagg gttgcaggga gagctgcacc caggtgtctg tgggccttgt cctaatgaat 54780
gtgggagacc aggccatggg cacccaaagg cagctaagcc ctgcccggga gagtagttga 54840
ggggtggaga gggacttgct tttcagtcat tcctcattct gtcctcagga atgtcccaag 54900
ccttcgggta gggtaagcat catggctggc agcctcacag gattgcttct acttcaggca 54960
tgtcgtgggc agtcagatga gtgagtcaag gcagtgggga ggtagcacag agcctccctt 55020
ctgcctcata gtcctttggt agccttccag taagctggtg gtagactttt agtaggtgct 55080
caataaatcc ttttgagtga ctgagaccaa ctttgggggtg aggatttttg aaaccgtctt 55140
cagtctctcc aaacagctgt gtccgttctc cacatccttg tcagacctca cctctgcttg 55200
tgctccctcc ctcccaggtg gtgcccctgc atccctaaaa gcttcagtac agctcggtgg 55260
tctgtgtctg caatgccaca tactgtgact cttgacccc cgacctttcc tgccctaggt 55320
gccttcagcc gctacaagag cagaagcagt gggcattgga tggagctgag tacaggacca 55380
tacaggctaa ttgcaccggc acaggtaacc attacaccct tcacccccg ggccaggctg 55440
ggtcctccta gaggtaaacg gtgtcagtga tcaccatgga gtttctccct gggcactgat 55500
aaccctgtgg atgtcctcag gcctgctact gatcctgcag ccagaagttc cagaaagtga 55560
agggatttgg aggggccgtg acagatgcag gtgccctcaa catccttgcc ctgtcacccc 55620
ctgcccagaa tttgctactt aaatggtact tctctgaaga agatgaggag gaaggggaca 55680
ggatgacata gagccactga cactttttctt tgccaattct tgtggaccct gacttctgcc 55740
catccctgac atttggttcc tgtcttaatg ccagtgaaat aagatttcgc cgcctatcat 55800
ctgctaactg ctacggactc aggctcagaa aggcctgcgc ttcacccagg tgccagcctc 55860
cacaggttcc aacccaggag cccaagttcc ttttggccct gactcagaca ctattaggac 55920
tggcaagtga taagcagagt cccatactct cctattgact cggactacca tatcttgatc 55980
atcctttttct gtaggaatcg gatataacat catctgggta cccatggcca gctgtgactt 56040
ctccatccgc acctacacct atgcagacac ccctgatgat ttccagttgc acaacttcag 56100
cctcccagag gaagatacca agctcaaggt aggcattcta gcttttttcag gccctgaggg 56160
ccctgatgtc tggggttga gaaactgtag ggtaggtctg cttgtacaga catttttgtcc 56220
cctgctgttt tgtcctgggg gtgggagggt ggggctaat ggctgaaccg gatgcactgg 56280
ttgggctagt·atgtgttcca actctgggtg cttctctctt cactacctttt gtctctagat 56340
acccctgatt caccgagccc tgcagttggc ccagcgtccc gtttcactcc ttgccagccc 56400
ctggacatca cccaccttggc tcaagaccaa gggagcgggg aatgggaagg ggccactcaa 56460
gggacagccc agagacatct accaccagac ctgggccaga tacattgtga agtaagggat 56520
cagcaaggat gtgggatcag gactggcctc cccttttggcc atgctgatct gtgtcccaac 56580
cctcaacctg gttccacttc cagatctgcc tgtcctcagc tcacctttct accttctggg 56640
cctttcaaac ttggatctgt cagtcttgcc cactccatca ggcttcctgt tctctcggtc 56700
```

```
tggcccactt tcttggctgg atcactcatg acctttctct tgccaggttc ctggatgcct 56760
atgctgagca caagttacag ttctgggcag tgacagctga aaatgagcct tctgctgggc 56820
tgttgagtgg ataccccttc cagtgcctgg gcttcacccc tgaacatcag cgagacttca 56880
ttgcccgtga cctaggtcct acccttgcca acggtactca ccacaatgtc cgcctactca 56940
tgctggatga ccaacgcttg ctgctgcccc actgggcaaa ggtggtaagg cctggacctc 57000
catggtgctc cagtgacctt caaatccagc atccaaatga ttggctccca aacttagagg 57060
gatttttcta cccaactatg gatcctagag caccattccc cgggacctcc agggtgccat 57120
ggatcccaca gttgggactt gaaacctctc taggctgggg gtggtagctc atggctataa 57180
ttccagcact ttgggaaccc aaggtgggtg gatcacttga acctaaggag ttcaagatga 57240
gcctgggaaa catggtgaaa ccctaactct acaaaaaaaa aaatagaaaa gttagccggg 57300
tgtggtggtg gcacgcctat agtcccaagt attctggagg ctaaggcggg aggtttagtt 57360
gagcctagaa tttcaggctg cagtgagcta tgattgtgcc actgtactcc agcctgtgtg 57420
acagagggag accctgtctc aaaaacaaaa acaaaaaatc cctcccaaaa cctctgtagt 57480
tgcattcttc ccaccaccta attcaggatt cctacaagag gaactagaag ttccagaagc 57540
ctgtgggcag ggtccagggt gacttgttct tcctttgcag gtactgacag acccagaagc 57600
agctaagtat gttcatggta ttgctgtaca ttggtacctg gactttctgg ctccagccaa 57660
agccaccta agggagacac accacctgtt ccccaacacc atgctctttg cctcagaggc 57720
ctgtgtgggt tccaagttct gggagcagag tgtgcggcta ggctcctggg atcgagggat 57780
gcagtacagc cacagcatca tcacagtaag ccaccccagt ctcccttcct gcaaaggagg 57840
acctcagacc cattagtagt ctcaccaaag actgatagaa gcccttcctg tccagctttc 57900
cccaggtagc ctgccctttt gggcaactct ggggaaccat gattccctgt cttgcctttc 57960
cttcacaggt ctgcacacct cattgcccct tttgcaacta ctgaggcact tgcagctgcc 58020
tcagacttct cagctcccct tgagatgcct ggatcttcac accccaact ccttagctac 58080
taaggaatgt gccctcacag ggctgaccta cccacagctg cctctcccac acgtgaccct 58140
tacctacact ctctggggac ccccagtgtt gcgcctttgt ctctttgcct ttgtccttac 58200
cctagaacct cctgtaccat gtggtcggct ggaccgactg gaacccatca ttgtagacat 58260
caccaagcac acgttttaca aacagcccat gttctaccac cttggccact tcaggtgagt 58320
ggagggcggg gcacccccat tccataccag gcctatcatc tcctacatcg gatggcttac 58380
atcactctac accacgaggg agcaggaagg tgttcagggt ggaacctcgg aagaggcaca 58440
cccatcccct tttgcaccat ggaggcagga agtgactagg tagcaacaga aaaccccaat 58500
gcctgaggct ggactgcgat gcagaaaagc agggtcagtg cccagcagca tggctccagg 58560
cctagagagc cagggcagag cctttgcagg agttatgggg tgggtccgtg ggtgggcgac 58620
ttcttagatg agggtttcat gggaggtacc ccgagggact ctgaccatct gttcccacat 58680
tcagcaagtt cattcctgag ggctcccaga gagtggggct ggttgccagt cagaagaacg 58740
acccggacgc agtggcactg atgcatcccg atggctctcc tgttgtggtc gtcctaaacc 58800
ggtgagggca atggtgaggt ctgggaagtg ggctgaagac agcgttgggg gccttggcag 58860
gatcacactc tcagcttctc ctccctgctc cctagctcct ctaaggatgt gcctcttacc 58920
atcaaggatc ctgctgtggg cttcctggag acaatctcac ctggctactc cattcacacc 58980
tacctgtggc gtcgccagtg atggagcaga tactcaagga ggcactgggc tcagcctggg 59040
cattaaaggg acagagtcag ctcacacgct gtctgtgact aaagagggca caacagggcc 59100
agcgtgagct tacagcgacg taagcccagg ggcaatggtt tgggtgactc actttcccct 59160
ctaggtggtg ccaggggctg gaggccccta gaaaaagatc agtaagcccc agtgtccccc 59220
cagcccccat gcttatgtga acatgcgctg tgtgctgctt gcttggaaa ctgggcctgg 59280
gtccaggcct agggtgagct cactgtccgt acaaacacaa gatcagggct gagggtaagg 59340
aaaagaagag actaggaaag ctgggcccaa aactggagac tgtttgtctt tcctggagat 59400
gcagaactgg gcccgtggag cagcagtgtc agcatcaccag cggaagcctt aaagcagcag 59460
cgggtgtgcc caggcaccca gatgattcct atggcaccag ccaggaaaaa tggcagctct 59520
taaaggagaa aatgtttgag cccagtcagt gtgagtggct ttattctggg tggcagcacc 59580
ccgtgtccgg ctgtaccaac aacgaggagg cacggggcc tctggaatgc atgagagtag 59640
aaaaaccagt cttgggagcg tgaggacaaa tcattcctct tcatcctcct cagccatgcc 59700
cagggtccgg gtgcctgggg cccgagcagg cgttgccgc tggatggaga caatgccgct 59760
gagcaaggcg tagcccacca tggctgccag gcctgctggt gtctggcgtt gcggtggtac 59820
gcgccggtat ggctcctcct cagtctctgg gcctgctggt gtctggcgtt gcggtggtac 59880
ctcagctgag ggtcaaggaa ggaaggtgtg ttaggagaac tagttcttgg atccctgccc 59940
actctcccca gggctgcccc tcccatctgc cccttacctc catcccaggg gaagtagaga 60000
ctgagaatgt gggtacaata ggcacagagg ttgtgcagcc cacgcaggtg gacctgcagc 60060
ttcccactgg gcagctttgc ctgcagcagc agggccaagt agctgaagac gaaggcgtcc 60120
aaggaggcag ggctggagca gagagagaag ggtgggatgg aggagaacca ctggggtaga 60180
aggggtaaag atggagctgg aggagagtc agccttggga ggtgggctct gggcagcagg 60240
cggccaccag ggaaggacag gacacacagt tctagacctg gtatggggag agatccccag 60300
gtggcgccag ctggccctga atagggctct atcccagggc tgcataaagg gcacattcag 60360
```

```
tgccccacag ctcttcaggc ccctcctgtg cctggctgcc ctcccaccct acccttttgt 60420
acctctgaga aggctctggc ccccacacag tcacactgtc actagggcca gtttctatcc 60480
cagggacctc ctatccagag cctgagccag ccccagcccc agccccagct ccagctgctc 60540
catctgaacc tgtatcttct tccaagccac ccattaccct cttggagtca gactcacgca 60600
tctccaaaga agaacttttg agagcccagg cgctgagaga gcagggtcag acactcccga 60660
gcctctcggt acagctgtag gggcgacaca ggtaggcttg cagctgtggg aacagtgcca 60720
cctccccacc taagcactcc cattcctggc cagcatcctt ggggctcatc tcatacaata 60780
gcccccggtc tcagagctac ctccttctcc agctcttcct cgtcctcagg cctgtgctcc 60840
ccagtcagca gctgtagccg ttccatgtac tgccgctgca tgcggccagg caggaagaag 60900
ttgaggggaa agggcatagc ctctgcatac cacttccggg tcacttccac gtagttcttg 60960
gtgtctatcc aaaaagtatg tacctggatt gggtgggcag gaagaaacag gtaggtctga 61020
gccagtgcac ctgtctgatt caaggtgggc ttctgacccc catgctttcc tgagcctgtg 61080
tgtgggtctg tgtgttcccg aaccctcccc ggctggccat ggatgctggg aggtctgggc 61140
acactcacca gcaccgggag caacttctcc tccaggagag acatgaaggc cagggtgtct 61200
gcccccttgcc gagctgacag atcataatca gcattgtact tctgtggagg aaatatccat 61260
ggcgtggaca ctagggagct gcaagggcac ttcaccaggg aggaaggagt cctgtctggt 61320
accccctca ctggcctctg agtgcagtgg aggtacagca aggaactttt cctgccaagg 61380
ccccttgcc tgggcccagc cagtagcctg ttgctgttgg cgaaaagcct gggccttgga 61440
gcctcctggc cgtgaaggtc cagcgcccaa tgcagggaag gaaggaaggc tccgccgcaa 61500
actaggagca gctcccagaa tttccatgga aagctggaac aacgcccgct gacggcaact 61560
ttctaacagt aacttccccg acccagacac cacaaagcta gcacaacgga gctcagatgc 61620
aggctaggac tcggtccatg cctcaggaac cagagaaagc catcctcaca ctccctggat 61680
ccagggaacc cacgcccagg gcccccagc ttgttccctc agtgcccagc tcttggctat 61740
ttctttcact tcattccatc gctcagacac cattaccaca tacacattcc acccataccc 61800
ccaggtctca gcctgcccta ccttcccagg ctccagtccc tgttcctcag catcccccctc 61860
cacatcctga gtaagctttg tccccagata acctcttcag catgatcctt aaatctccct 61920
aagcctcagt ttctcccctg tggaatgggg gtaagaatct ctttctctga atgcccctgt 61980
gttaggaaat aatttagaat actttggaaa ctggaaaagc tctgttcaca cctaagcaat 62040
cagggcagtg gcctcggctc tgccaggaac tttggctttt atctggatcc tctctttcca 62100
ggcctctcaa ttaattcccc aggtcctcaa cctttgggaa gttagaaatg aggaagagtg 62160
tcctacttct gacactgttc cctcttggaa cctgaccgtc aatgctagaa gaacccttgg 62220
aaaacatgct ggcccagccc tctagtttta caaataaggg agtgcacagc cctgagaggt 62280
tacatggcct gcccgagatc acatagtcaa tggcagagta aagagcatag cctaggcctc 62340
cccactcctc tagtaatgct ctttcatctt ctccaacctg gctctaagcc ttgtccatcc 62400
tgagccccat atctagccca acctagtccc tgaaaacagg aagtggccct tagaaatctc 62460
tctccagtcc caccatcaga ggccaactgc tgtcttccac tctccttcag cctgtgctcc 62520
tctccctccc tgcctcacag tgccctaagt ttcatctctt gccgactgct ttaatacatc 62580
acagtgacat tgtgtgtgtc tctgccacaa gactgttgct ccttgatgct ctgggtcacc 62640
tgcatctagc atggcatata tctggtgctc aataaatgtg tattgtatag aattgactga 62700
acttctctca ctggcagccc cctctatcca agtcacctac ctcttttcga aggtgggtga 62760
tgatcttgtg tggaactgag atgacctctc catgactggt ccgaagggca ggcagagttc 62820
ctgatattga gaggaagta taccaaccag acccttagct gcctagtcat acatagttgc 62880
aacacattcc tgcctatttc ttgcttctcc ccttgtacac acccttcctt accccaagg 62940
gatactgggt acctgaaggg ctctgccagg ggttgctgat cttgtgtacc ttcagtggag 63000
caccagtaaa tctggcatag gtctgcaggg aaggaagcag aagtcagaga ggcagagcca 63060
tgtccccac agtggtatca agaagagaaa taacatttat tgaataccct atgtgccatt 63120
ccctatactt agtatcttag tctcgaaaaa aaaggggggag tcactaccat ttctatttta 63180
caaatggaca acacagggct cagagagatt ccggacatgt ctgtgattac aggacagcca 63240
ggaaaatcct ttcctctatc tcctctcttg ccatctacct ggtgaacatc tatcctcaga 63300
agctttcct aaccagtatc cctcttcttg gaagcactga taatgccctt ctctttggca 63360
gtatctgtgg tctgttccta ctttaactta tatgtgaata ttttattata tttatttgct 63420
tacctatctg cctttctgta aactcgaagg gaggaaccaa attttattca tctttgcctg 63480
gcaatgttta atatttggaa gaaatctaat agatcctctt taaagcaagg agtcaatgaa 63540
taaatgaagc aaaggaagtc tgattgctaa gctctttata caaagcctgg ctgtgagtcg 63600
tttggtctaa caaacaatag cctcagtaaa tgctgttaag tgaggaggaa gaggagaagg 63660
gggctgagga gaaggcagga attccaagct agagtaggtc cctgagacag tccagcctag 63720
taaacctccg aatggagaaa aaaaatgccc aaagagaaag gatctccgca aggtcacaca 63780
gccagtgaat ggatgagcaa ggactagaac ccatcacctg aactcccaac caggcgtctt 63840
ttcattgctg cattaagcct agaaaactac agcatagggc actgaggcca tatcggccac 63900
gtacgctctt tgactgcctc agtttcccc actcgcccg tgctgagtag ccctggcaag 63960
gtttggatgc ttggctagtt cggcccctc cccagtcatc agggcacagc agagggcgcc 64020
```

```
ggcgccaccc ctcaccagca cggccaggct gtccaggtcc actgacggca gcccccagcc 64080
ccctgaccag cagaacagct ccatgggcgc cgccatcttg cccaccctct gtcccggaaa 64140
cacttccttg tgtgcttctg ccctcccctg cctgggcccg cccccgcca ccgcccctcc 64200
gatcgttgcg gtcagggggc ctggggagat ccccgggag gcgaggcttc ttctggcccg 64260
actggcagct gaactgcggg ggactgggcc gcgggcctcg ggggagggcg gccgccggcc 64320
catccagagg tggcccacgt agcgggacag cgctgtcggc ccggcgcgcc tcggagtgtc 64380
acggcgcctc gtccaagtgg agccccgaac ccctgaaggc gcggcaggct ctggagagcg 64440
gggtcttgtg cgcctgggcc aggtctgggg gctcttgcca aactgcacgt ggcctgtact 64500
gctccaggc ccccttgggc tcgtccccga gcgggactg cgggggggtc ccccgagcag 64560
catgttttcc acagcgcgtt atgtttggag cgggccctgc gccgcctgtc gccatggaaa 64620
caaaacaggg gcggtggcgg cggccggagc ggaggccggg ctggggcttg ggtgggggag 64680
gggaagagag gctcgcaggc tgtcgcttag gtgacgggaa ctcaggcgcc cctctgcttc 64740
atccgggtca cggcccgtcc gctagtaccc acagtgttcc acagtctggt ccttggctcc 64800
tcgcctgtac ccctggtctt ctgcgcctgt ccctggtgtc cctttcctct tttttggttt 64860
cttcactctg acctcactga ccactgcttt agattctccc ttcagttccc gtcagacgct 64920
tccagactcc caagctttcc tacgaatgag ggaaaatgga gaaacaggca cttgtcaggg 64980
gacccccacc ctaataaaga gcacttgctc cgccagaaca gcaaaattca tgccatgtgg 65040
gcatccctgg gcactatagc aagctagttg cggccactcc cttggcatcc tttcctgcca 65100
gctgtggaat aatgcccact gtctagcact gcccctgcca ggggttcttg ccttccacaa 65160
tcgtggcttc cagaaaacag tggcattcgg tagcgctgtg tgccgagacc cccaacaatg 65220
atgactgcgg agagggaggc acctgggggg aggatcatta gggagaggta gaaagcaggg 65280
aggcctccag gattctttcc cagtgcccct ggttcccaga gctgatgatg cctccagggt 65340
gattggcagc tctttgtttc agcccccccct cacccgcctg ctggcccccc ctccaattct 65400
gtccctccgc cccccggctc ctgctctctc cgcctagcct tttcccctcc cagctgcctg 65460
cctgccaggg gtagtgagcc ggctgagagg catggagacg caggaacttc gggggggccct 65520
ggctcttctc ctcctttgct ttttcacatc tgccagtcag gatctgcagg gtaagcctgt 65580
ctccatcctc ttagaccgct ctctgcttct tccccatttg ccctcagccc aagtagcaga 65640
gaacatgtgg gcaaggggag aggggaagag tccagaaatt gagccagagg aaaacttaag 65700
actgcctaga gttggtgaaa ttatggcctg gtggagagga gtgggcaccg gagagtagtg 65760
ggggagctgg aacaggacag ggtcaggcat gaggccaggg cagaggactc aggaactgga 65820
tgctcaggct gcctggctgg ggtggttcct gagcatctgt aggcaccta gggtctggga 65880
gagcagcctg aaggtgggcg tactgtaggt ccctgggctt cgtcccctg ggctcctggc 65940
tgcccaagga caggcgggg gtggggacca agaagcctgg gctctccgg aggtctggtg 66000
gtgggatggg ccgatggatg tgggagaggt agctggagca gatgacacag gcatagattc 66060
tttactggct ggagggaaaa ccacagattg gccaggacac aggaggcaga ggagctgggt 66120
cctacattcc cgtgggagat agcccagatg gtgggagggt tagagtcctc agtgggcagc 66180
tgttcttatc cagagcgagt gtgctgcgcc cctaggatgg gaggagggga actagggtgt 66240
ggaacgagcc aaacccagga gtggaaagag aagctgcctt ccatttctac gttgtggaca 66300
ccaggtgcca ctcctgtggg ggatcagcac agcatctcct ttgcgccacc tggtgggggc 66360
atctcaaatt tgtggggtgc tgtttctgtg tttccaagtg agtctcaaac ctgcaggttc 66420
ctggaaggta gtaataggca ataatgggga aaggaaggca cagtgcctct gtcctctgag 66480
agcaacaagg gttgaggttt ttttttgttt tcgtttttgtc ttttttgagat ggagtttcac 66540
tcttgttgcc caggctggag tgcaatggcg cgatctcggc tcactgcaac ctccacctct 66600
caggttcaag cgagtctcct gcctcagcct cctgagtagc tgggattaca ggtgcccgcc 66660
accacgcccg gctaggtggt ttttttttct tttttgttgt tgtttttagtag 66720
acacggggtt tcaccgtgtt ggccaggctg gtctcgaact cctgacctta ggcgatccac 66780
ctgcctcaac ctcccaaggt gttgggatta caggtgcgag ccaccatgcc cagccaaggg 66840
ttgaattttg aggtgactaa cgctgcctgg tggtggggt aggggtgat gtgggctcgg 66900
ggagggcata ccttagcatt tgatcccatt ctctaacctt gataacccct gcctgaccag 66960
taattgacct gctgactgtg ggcgagtctc ggcagatggt agctgtggca gagaagatcc 67020
ggacagcctt gctcactgct ggggacatct acctcttatc caccttccgc ctgccccca 67080
agcagggtgg tgtcctcttt ggcctctatt ctcgccaaga caacactcga tggctggagg 67140
cctctgttgt aggcaagatc aacaaaggtg actggtgggc atctcctttc ttgcaatggt 67200
gacctcctta agcactctcc ctcatcccta cttcccaagt gcttcctcat tctccttggc 67260
ctccattagg gaccaaggtc ccatcaggct gtgccagac atcaggggca cctggtatgg 67320
ggtgcttata aggtgcttta ggagcccatg taccaaacaa tagggtgagg cttgagtcct 67380
gatatttata gggatgggag gttgtacttg gggatgcctg gaaggagggt gaggcatgtc 67440
tctgtgcctc agcggtgata cagaaaggtc tttcagatcc ctggaacagt cagtggccac 67500
aaaaccagct gtcaccctag gagaggatac agtcatctga taccaatgaa gactaagaaa 67560
gtatttgtct ctaaaccaat tatttttta aatggagtct tgctttgtca cctaggctgg 67620
agtgcagtgg tacaatctca gctcactgca acctctgcct cctgggttca agcaattctc 67680
```

```
ctatctcagc ctcctgagta gctgggacta caggtgccca ccaccatgcc tggctaactt 67740
ttgtattttt agtagaaaca gggttttgcc atgttgacca ggctgttctc gaacttctga 67800
cctcaagtga tctgcccacc ttggccttct aaagtgctgg gattacaggt gtgagccacc 67860
gtgcctggcc tctaaagcaa tttcaaaaac atttattgtg tacctattaa atacaaggtg 67920
ttgagagcca catagtagaa ttagggatag gggccctaga gatgtggtat ctagcagagt 67980
tgatccaagg ctcagctggg aggcaggggg tggggatag cgcccatact gatctcccct 68040
cctgggcagt actggtgcga taccagcggg aggatggcaa agtccacgcc gtgaacctac 68100
agcaagcggg cctggctgat gggcgcacac acacagttct cctgcgactc cgaggtccct 68160
ccagacccag ccctgcccta catctctacg tggactgcaa actgggtgac caacatgcag 68220
gccttccagc actggccccc attcctccag cggaggtcga tgggctggag attaggactg 68280
gacagaaggc gtatttgagg atgcaggtga gccgggagga gcctctgagt tctgtggaaa 68340
tagagtttgc accagctggg gaaggggttg gtagaccttc ccaccttact ctgctgctat 68400
ccccccaggg ctttgtggaa tctatgaaaa ttattctggg tgggtccatg gcccgggtag 68460
gagccctgag tgagtgtcca ttccaagggg acgagtccat ccacagtgca ggtaacacag 68520
agacttgttt gctgacattg gaccacggat cctgtggcct ttggtgactc ctgtcttctt 68580
gatctccctc tcccttaaaa cccattcctt tggctcacct gttcctaggg tttctaaccc 68640
tgttattcca aatctttcac ctgactccac aatctccaat acacccatcc gagaaaaaaa 68700
gtgatctaag agaagaattg gttaattgct tggccttggc tgaccaagag atactggtct 68760
cgagtatttt tttttttttt ggtgatggag tcttgtcctg ttgcccaggc cggagtgcag 68820
tggtgcaatc tgggtcactg cagtctccac tgagttcaag tgattctcct gcctcagcct 68880
cccaagcagc tgggattaca ggcggccctc caccatgcct agctaatttt gcattttag 68940
tagagatggg atttcaccac gttggccagg ctggtctcaa acacctaatc tcaagtgatg 69000
cacccacctc ggcctctcaa agtgctggga ttacaggcgt aagccaccgc gcccggcctg 69060
gtctcgagtc ttttatagtt ctcactggca gctgtcacca gcaatttctc tgagtgttgc 69120
ccatctgcct ggtctctctg acagggatgt tcagaagctc tcacctaaat aaaagaccca 69180
cctttcccag atatttgagg gagagctctt gaagaaggga atgggatggc gggtgtggtg 69240
gctcacacct gtaatcccag cactttggga ggctgaggtg ggctgatccc tcaaggtccg 69300
gagttcaaga ccagcctggc caacactgtg aaacctcctc tctactaaaa aatacaaaaa 69360
attagctggg catggtggtg ggcacctgta gtcccagcta cttgggaggc ggaggcagga 69420
gagttgcttg aacccaggag gtggaggttg tggtgagcag agatcacgcc actgcattcc 69480
agcctgggaa acagagcaag actccgactc aaaaaaaaaa aaaatgggga tatactgggg 69540
ccctggccct gctttgggtc catcccttct gccactacca tgcctaggaa ccaggaggat 69600
ttgggttcta acttcctgtg aagcaactcc cttagagggc cttttgcccc atagaaggag 69660
ctggcactgc ttgtctgcca gctctgccct cccagcatcc agcaccccat ctttattctg 69720
gggctccagc cctgtccctg tcctcacctt ccttcctcct tctcaccaac caggcctctc 69780
ttcacttcac ctcaccccctc tgactatgtt ttcttctcct ctccagtgac caatgcactg 69840
cactccattc taggtgagta ggccacactg aagcggaagc ggggagcggg gaggaggccc 69900
caggctctgg cagctgcctg aaactaagtc ctcttcagtc aggaatgtag taggtttaaa 69960
ggcaggggtg ggcagccgtg gcaggtactg gcttattgcc catggagggc ccaggactgg 70020
tgctccagta ctgaacccct cacaccctgg gtcccgacag gggagcagac caaggcgctg 70080
gtcacccaac tcaccctctt caaccagatc ctggtggagc tgcgggatga tatacgagac 70140
caggtttggg tgggctggcg aagggtggca ctgattctgg ggtagggtgg cagatgtcaa 70200
gtgctgactc ctccccatcc ttctccaggt gaaggaaatg tccctgatcc gaaacaccat 70260
tatggagtgt caggtgtgcg gtgagtggga gagcagggga ggctccacat gaccgtgcca 70320
cgttcccacc attggctttg gctttccctt ctggtggctt aaatagtgac caccgggtag 70380
ctctgactgt gtccacccct caggcttcca tgagcagcgt tcccactgca gccccaatcc 70440
ctgcttccga ggtgtggact gcatggaagt gtacgagtac ccaggctacc gctgtgggcc 70500
ctgcccccct ggcctgcagg gcaacggcac ccactcagt gacatcaatg aggtgaggga 70560
ggtcagagcc cagaagggta cagaaaactg gggtgaggat gtcaggaggc acccaagagg 70620
gtgggataaa tgctggtccg gaggagagga atctggagtt taggagaggt cagaggcaag 70680
agaaatgcaa gatgggagag acagaaggcc tggggcaaag actgaaggcc atacagggaa 70740
ggagctgggg aaactgcagg ggaggcttga gatggcgacc agtggcatgg ggagggagag 70800
agggaacccc gagggaagtg gggtggggac caggagcaca aggcagttgt gtggggagag 70860
ctgcacaaag gggagacctg gagcaatggt tcctggatca caggcaggga cctgagtttc 70920
ccagagggcg gcctgacctc tgccttctca tctggtcccc agtgtgctca cgctgacccc 70980
tgtttcccgg gctcgtccag gctcaaacacc atgcccggct tccactgtga ggcctgtcct 71040
cgagggtaca agggcacaca ggtgtctggt gtgggcattg actatgcccg ggccagcaaa 71100
caggtcagac tgggtagtgt gtgtggacaa gggatcttgg ccttgtagag gccaggggct 71160
tctgggttgg acatgggacc cttgtgatga atgggacatg gatggctttg catcggcttt 71220
gggtctgggc ttaatgttga tgttcacaga taaggccata ccagtgtcct ctgctgtatc 71280
tgaggagacc caccataggt ctggttccac ccaaagtctg ccccttcagg tctgcaatga 71340
```

```
catcgatgaa tgcaacgatg gcaacaatgg tggctgtgac ccaaactcca tctgcaccaa 71400
cactgtggtg agctgaatat cctgagtgta ttctggggtg gtgggaatgg taaaacccca 71460
accccgccc cttcttacct tcaaatttcc tgctgccttt cctcctcccc agggcactac 71520
acagattagg tgttcacatg gacttggttt ggaatactgg tttgcctctt gctagctctt 71580
tagcaggtta tttaactttt ctgagcctca gcttcctcat ctgaaaactg aggctgttat 71640
ccaccctgaa aggttgtcat gataacctaa aggagatact gatatgcctg gcataactga 71700
gtgcccagcc cacactccgc aggtggagca gtgctggtcc tgggtgcctg gtgggctcac 71760
cctccttcct aagatgctgc ctctccactc ttagggctct ttcaagtgtg gtccctgccg 71820
cctgggtttc ctgggcaacc agagccaggg ctgcctccca gcccggacct gccacagccc 71880
agcccacagc ccctgccaca tccatgctca ctgtctcttt gaacgcaatg gtgcagtgtc 71940
ctgccaggtg agctaggctt caggcgtgga aggaaaaggg agggtctggg gaaaggagta 72000
gggctatgtt tagggcctgg gttggggggtc ttcataggag agaaggtggg cctgggccca 72060
ggaactgttt ggtggggaga ataggacctg aagcagggaa aatataggga ggagggagc 72120
cagaccaaac tgctagctcc tacccctttgt gttgccctag tgtaacgtgg gctgggctgg 72180
gaatgggaac gtgtgtggga ctgacacaga catcgatggc tacccagacc aagcactgcc 72240
ctgcatggac aacaacaaac actgcaaaca ggtgcaggga gcaggcgggc aagggggcgt 72300
agtggggagc ccaagctggg tcaggccaga actcatccat cctcttcccc tgaactttag 72360
gacaactgcc ttttgacacc caactctggg caggaagatg ctgataatga tggtgtgggg 72420
gaccagtgtg atgatgatgc tgatggggat gggatcaaga atgttgaggt gactcccaga 72480
ctgccctgcc ccttgaagct cctctcccct cctcctgtcc tctctgtgcc tcacttacct 72540
catctggcag ctctctagta agggccaaat actccaaatc agggaggcaa aaacctcgtg 72600
cccaggacaa ggaggctggg tgggtgggac tgtactgagc agtttgtcca tcacaagggt 72660
gtgatcttag aaaaggatac agagacaagg taggtgcaag atgacaagtg atttagggga 72720
gacctgaccc ttcccctccc accctctgcc caggacaact gccggctgtt ccccaacaaa 72780
gaccagcaga actcagatac agattcattt ggtgatgcct gtgacaattg ccccaacgtt 72840
cccaacaatg accagaagga cacagatggc aatggggaag gagatgcctg tgacaacgac 72900
gtggatgggg atggtgcagg cctggggctg aaggggtggc tgggggacct gtgagaattt 72960
ggatcaggtg gggatgaagc agggaagcta ggaagtctct gtgaaatagg gaggcaggct 73020
tgtggacgtt ggcctgggtg aggagagatt acctgcagca gatgtcaata ggaatgtgag 73080
gtagggcgta gtgttaggca gagtgtggac tagagggtga gacaagaaac aggcagattt 73140
cctggccagt tgtcctctgg gtggggagac aaagttcggg actttcacca acctagaaga 73200
gagaatatgg catgttctag taacaacctt gtgctaccca tgtcttctag gcatccccaa 73260
tggattggac aattgcccta aagtccccaa cccactacag acagacaggg atgaggacgg 73320
ggtgggagat gcttgcgaca gctgccctga aatgagcaat cctacccagg tacagggaga 73380
tggtaaggac aggggaggga tgagggtact gatggatgaa gccccagccc tttggatgga 73440
aagtggtcag atcaccctct tcagagttat caagaggaga tggtgagaac aggtccctct 73500
ctctcagaca gatgcagaca gcgacctggt gggggatgtc tgtgatacta atgaagacag 73560
gtaaggtctt ggtcaagaga cgcaaggtct ttctttttt tgtctttctg agacggcttg 73620
ctctgtcacc taggctggag tacagtggca cgatcttggc tcactgcaac ctccgtctcc 73680
cagggtcaag tgattctcat gcctcaacct ccctgagtacag ctaggattac aggcatgtgc 73740
taccaagccc agctaattct tgtattttca gtagagacgg ggtttcacca tgttggccag 73800
gctggtctcg aactccttac ctcaggtgat ccgccagcct ctgcctccca aagtgctgtg 73860
attacaggtg tgagccactg tgccagcgaa atgcaaggtc ttataggga tattttactt 73920
tcctctagta tatcctttt ttttttttt tgagacggag tcttgctctg tcgcccaggc 73980
tggagtacag tggcatgatc tcggctcact gcaagctcca cctcccgagt tcacgccatt 74040
cttctgcctc agcctcccaa gtagctggga ctacaggcgc ctgccaccac gcccggctaa 74100
ttttttgtgt ttttagtaga gacggggttt cactgtgtta accaggatgg tctcgatctc 74160
ctgatctcgt gatttgcctg cctcagcctc ccaaagtgct gggattacag gcgtgagcca 74220
ccgtgcccgg cctccttttt tttttgaga tggagtcttg ctctgtcact caagctggag 74280
tgcagtgata tcggctcact gcgacctcca cctccagggt tcaagcgatt ttcctgcctc 74340
agcctcccag tagctggatt acaggcgcgt gctaccaagc tcagctaatt tttgtgtttt 74400
tagtagagac agggtttcat cgtgttggcc aggctggtct cgaactcctg acctcaggtg 74460
atctgcccgc cttggcctcc caaagtactg ggaatacagg catgagccac tgtgcccagg 74520
ccatagtata ttctaaattc cttctatgat ttagccttaa ttctctattg ctattcagca 74580
ggaatttatt cttacagtca tccctccatt cctactgcca gaccttcacc tcacctggct 74640
gactgccagg ggtctgattg tatggagagc aggctccaga gactcccagg cagaagcgaa 74700
gggaaggaca aggagtacct ttaaatcctt tatttggtac ctgttcttct gattagcgat 74760
ggggatgggc atcaggacac caaggacaac tgcccacagc tgccaaatag ctcccagctg 74820
gactctgata acgatggact tggagatgag tgtgatgggg atgatgacaa tgatggcatc 74880
ccagattatg tgcctcctgg tcccgataac tgccgcctgg tacccaatcc caatcagaag 74940
gactcagatg gtaagcctgc ggacccagag cacgttagac tggtgttgcc tttgcccagg 75000
```

```
tggaggcagc aagccctgtt gggaagtgag gaagggcaag gtgggaaaga tgtcaggaat 75060
gcaggcccaa cagatgggtat tgttgcctaa tggcagtggc cagggccttc ctgagcaccc 75120
agcctcactc tgcccaggca atggcgttgg tgatgtgtgt gaggatgact ttgacaatga 75180
tgctgtggtc gaccccctgg atgtgtgtcc tgaaagtgca gaggtaacgc ttacggattt 75240
tcgggcctat cagaccgtcg tcctggatcc                                    75270
```

```
<210> 55
<211> 2385
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. X86809

<400> 55
gccagagcgc gcggggcagt gtgcgcggga gccgaggagg aggttccgga cgctgcttag 60
gaaccgggga ctcaggagtg cccgcgccct gagcgctcag ctccagaggc gtcatggttg 120
agtacgggac cctcttttcaa gacctgacca acaacatcac ccttgaagat ctagaacagc 180
tcaagtcggc ctgcaaggaa gacatcccca gcgaaaagag tgaggagatc actactggca 240
gtgcctggtt tagcttcctg gagagccaca acaagctgga caaagacaac ctctccatca 300
ttgagcacat ctttgagatc tcccgccgtc ctgacctact cactatggtg gttgactaca 360
gaacccgtgt gctgaagatc tctgaggagg atgagctgga caccaagcta acccgtatcc 420
ccagtgccaa gaagtacaaa gacattatcc ggcagccctc tgaggaagag atcatcaaat 480
tgggtccccc accgaagaag gcctgagcaa gggggaggaa gaggaggaag gttggacctt 540
catcagacca cttccttccc ccatcctcca ggagaggggg caagggcaac ccaccatcta 600
cccacttact aacctggtcc taacccccctt actgtgcgcg tgtgtgtgcg tgtgcgcagc 660
tctggctgtt tgtctatatg tctagctcat ctagttcctc ttcttaaggg gatgggggtc 720
aggggctagg ggaggggct gagtttcccc actttaggag gaggtggggg ctatttctat 780
gcaaatagaa atcagcacat tcctcctact tccctttcct ccactccccc catatcttta 840
aagtgtggaa gcagaaagga cctgcatttt cctacattga ggagctgaca taggggtaag 900
gtatgggaga ggtaggtgga tccaggaaa agcagtgggg acggaaggca aagagaccac 960
ttaacccccca cctggaaggg gcaaagaaaa gccagagttc catgtttgta ctcctgtgct 1020
ggactgtttc ctgagtacca gcaggtccct ttttgtctct catgggccta gcataggtat 1080
gagccaggga tcctttcctg gtccctaaga tcaaaccccca tggagcagcc agcgttagat 1140
gcccccaccc acctgtactc tggagagact gtgctgggaa catgtaccac tgagcctgag 1200
atggggatga gggcagagag aggggagccc cctcttccac tcagttgttc ctactcagac 1260
tgttgcactc taaaccttag ggaggttgaa agaattgaga cccttaggtt ttaacaacga 1320
atcctgacaa caccatctat tagggtccca aattggttat tgtaggcaac cttccctctt 1380
ttcttggtga agaacatccc aagccagaaa gaagttaact acagtgtttt cctttgcacc 1440
gatccccacc ccaattcaat cccggaaggg acttacttag gaaacccttc tttactagat 1500
atcctggccc cctgggcttg tgaacacctc ctagccacat cactacagta cagtgagtga 1560
ccccagcctc ctgcctaccc caagatgccc ctccccaccc tgaccgtgct aactgtgtgt 1620
acatatatat tctacatata tgtatattaa aactgcaggggg tgggaggga atgccacagt 1740
ggtgtctagc attaacttat tgtctaggcc agagcggggg tgggagggga atgccacagt 1740
gaagggagtg gcagaatcaa attgctacat agtccaaaca aaaaagaagg cttttcaaa 1800
aaacattaaa ttcacatgca gtctcagaga cttttttagac aaagttcaag ttaggagctt 1860
ttaggatgtg ggagtaaaac tttaatggga gggggagggct ggctgctgga agaaggaaga 1920
agccagactg gttagacagt actcttaact cctagcccag cctagcgtgc cctgcccctc 1980
tggccactgc tgcagacacc tgccttaaca cacacacctc taggactcca cagttttgcc 2040
ttaaaggacc ttcccaagtc tcccttttccc tgtctggctt ctcccttaag aagagagaga 2100
tacttgtaga attgggtggg gggaatgagc atgaactgtc cttccatttg ggatatgtta 2160
cattagagtg agagagagaa taaggagcct ttcttatgga agaaatggga gaagagagac 2220
agggttcttt tcagcagagt ctagtagttt ctctgtaagg caaaataatc taaaaagact 2280
aacctgccca cccactcctt atattgctgt gagattgccc ctatcttgtg ctcttctgtc 2340
tgcagtgtgc acggccttgt tctaacccgg aataaaggtg attga               2385
```

```
<210> 56
<211> 1689
<212> DNA
<213> Homo sapiens
```

<220>
<223> Genbank Accession No. U32680

<400> 56
cccctagaca agccggagct gggaccggca atcgggcgtt gatccttgtc acctgtcgca 60
gaccctcatc cctcccgtgg gagcccccett tggacactct atgaccctgg accctcgggg 120
gacctgaact tgatgcgatg ggaggctgtg caggctcgcg gcggcgcttt tcggattccg 180
aggggagga gaccgtcccg gagccccggc tccctctgtt ggaccatcag ggcgcgcatt 240
ggaagaacgc ggtgggcttc tggctgctgg gcctttgcaa caacttctct tatgtggtga 300
tgctgagtgc cgcccacgac atccttagcc acaagaggac atcgggaaac cagagccatg 360
tggacccagg cccaacgccg atcccccaca acagctcatc acgatttgac tgcaactctg 420
tctctacggc tgctgtgctc ctggcggaca tcctccccac actcgtcatc aaattgttgg 480
ctcctcttgg ccttcacctg ctgccctaca gccccgggt tctcgtcagt gggatttgtg 540
ctgctggaag cttcgtcctg gttgccttt tcattctgt ggggaccagc ctgtgtggtg 600
tggtcttcgc tagcatctca tcaggccttg gggaggtcac cttcctctcc ctcactgcct 660
tctaccccag ggccgtgatc tcctggtggt cctcagggac tgggggagct gggctgctgg 720
gggccctgtc ctacctgggc ctcacccagg ccggcctctc ccctcagcag accctgctgt 780
ccatgctggg tatccctgcc ctgctgctgg ccagctattt cttgttgctc acatctcctg 840
aggcccagga ccctggaggg gaagaagaag cagagagcgc agcccggcag cccctcataa 900
gaaccgaggc cccggagtcg aagccaggct ccagctccag cctctccctt cgggaaaggt 960
ggacagtatt caagggtctg ctgtggtaca ttgttccctt ggtcgtagtt tactttgccg 1020
agtatttcat taaccaggga ctttttgaac tcctcttttt ctggaacact tccctgagtc 1080
acgctcagca ataccgctgg taccagatgc tgtaccaggc tggcgtcttt gcctcccgct 1140
cttctctccg ctgctgtcgc atccgtttca cctgggccct ggccctgctg cagtgcctca 1200
acctggtgtt cctgctggca gacgtgtggt tcggctttct gccaagcatc tacctcgtct 1260
tcctgatcat tctgtatgag gggctcctgg gaggcgcagc ctacgtgaac accttccaca 1320
acatcgccct ggagaccagt gatgagcacc gggagtttgc aatggcggcc acctgcatct 1380
ctgacacact ggggatctcc ctgtcggggc tcctggcttt gcctctgcat gacttcctct 1440
gccagctctc ctgatactcg ggatcctcag gacgcaggtc acattcacct gtgggcagag 1500
ggacaggtca gacacccagg cccacccccag agaccctcca tgaactgtgc tcccagcctt 1560
cccggcaggt ctgggagtag ggaagggctg aagccttgtt tccttgcagg ggggccagcc 1620
attgtctccc acttggggag tttcttcctg gcatcatgcc ttctgaataa atgccgattt 1680
tgtccatgg   1689

<210> 57
<211> 925
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. D26600

<400> 57
ttttttctgc taccgtgact aagatggaag cgttttggg gtcgcggtcc ggactttggg 60
cggggggtcc ggccccagga cagttttacc gcattccgtc cactcccgat tccttcatgg 120
atccggcgtc tgcactttac agaggtccaa tcacgcggac ccagaacccc atggtgaccg 180
ggacctcagt cctcggcgtt aagttcgagg gcggagtggt gattgccgca gacatgctgg 240
gatcctacgg ctccttggct cgtttccgca acatctctcg cattatgcga gtcaacaaca 300
gtaccatgct gggtgcctct ggcgactacg ctgatttcca gtatttgaag caagttctcg 360
gccagatggt gattgatgag gagcttctgg gagatggaca cagctatagt cctagagcta 420
ttcattcatg gctgaccagg gccatgtaca gccggcgctc gaagatgaac cctttgtgga 480
acaccatggt catcggaggc tatgctgatg gagagagctt cctcggttat gtggacatgc 540
ttggtgtagc ctatgaagcc ccttcgctgg ccactggtta tggtgcatac ttggctcagc 600
ctctgctgcg agaagttctg gagaagcagc cagtgctaag ccagaccgag gcccgcgact 660
tagtagaacg ctgcatgcga gtgctgtact accgagatgc ccgttcttac aaccggtttc 720
aaaccgccac tgtcaccgaa aaaggtgttg aaatagaggg accattgtct acagagacca 780
actgggtatat tgcccacatg atcagtggct ttgaatgaaa tacagatgca ttatccagaa 840
ctgaagttgc cctactttta actttgaact tggctagttc aaagatagac tcttctttg 900
taaagtaaat aaattcttca aaatg   925

<210> 58

<211> 86080
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AL008726

<400> 58
```
gatcagagta gtaaagggtg aggcagcatg gtaaaatggg gagagtacaa gccttgaagt 60
ccaaaaccca agatccaagg ccagcctctg cgagttgtgt gaccttgggc cggtagcagt 120
gcctctctga gccatttctt catctgtggg attggacctg tctgtggggt ctccctcaca 180
gagagaccat ggtaaatggg aacccgggta taagtcacct agcttgtgct gggtacacag 240
cgttggtgct tggcaagagg aatgtcccgt ctttgaacca tggtaagggg caggggatag 300
gaggagaaag tgacaggtag gccactgttt actgaacccc atgacgtgcc acacactgtg 360
ctaagcattt taacatgatc tcatctagtg ctcctcctat gaggtagcaa cgattatccc 420
cacttgactg cagagctttg taaattataa aggtctatac tcactctgtc accaaggctg 480
atgtgcagtg gtgctattat agctcactgc agcctctatc tcctgggctc aagtgatcct 540
cccacttcag cctcccgagt agctgggact agaggtgcac caccaccct ggctttttt 600
ttttttgtat ttttatagag atggggtttc accatgttgc ccaggctggt ctcgaactcc 660
taggctcagg ggatccttcc accttggttt cccaaagtgc tagaattaca gtcatgaggc 720
accatgccca cccatgttga tgattcttat tattaatcct gactggaggg aagttgggac 780
agacagtcct tggggcacct gtccagatgg aaaaatgtat ggagggatgg aggagaggag 840
gatgtgcatt tggaggagaa ataatcattg aaagcaaaga tccttctctg aaagttacct 900
tctccaggga aagggtgttt ggattcactt tttttgaagt aaggagtagg caggggaagg 960
ttctttaagt ggtaaaagga cagctggccc cttcctagag ctcagtgaag aaatctggtc 1020
atctggggag taaaggggtg ggcagaccaa gtccagaggg agcccaacct gagaatccac 1080
aaggtgcagg ctgggcactg gggagtaggc aaggcttgta gacagtggct acgtggacag 1140
aaagagcacc aagacaaccg atagcaggct ctggggccag gaaaggggggg ctggacacca 1200
aggaatgcag atggacagtg gcaactgggc tgcccccttc ccctatatat agacattccc 1260
aaggaaagct cagcagggct gggccaagct aaataaggcc tcccccaggc aggcagggtg 1320
ccaaagggtg agggagaccc atgggattcc aatttagttt ttattgtttt ttggtttttt 1380
ggggttttgt ttttgagaca gactctcact ctgtcaccca ggctggaatg cagtggcaca 1440
atctcggctc actgcaccct ccgcctccta ggttcaagtg attctcatgc ctcagccttc 1500
tgagtagcta ggattacagg cacataccac tacgcccagc taattttgt ttttggtttt 1560
tttttttttt tttttttgag acagagtttt gctcttgttg cccaggctgg agtacaatgg 1620
tgcaatctcg gctcaccaca acctccgcct cttgggttca agcaattctc ctgcctcagc 1680
ctcccgagta gccggaatta caggcatgag ccaccatgcc cggctaattt tgtattttta 1740
gtagagacag ggtttctcca tgttggtcaa gctggtctca aactcccaac ctcaggtgat 1800
ccgcccacct cagcctccca aagcactggg attacaggtg tgagctacca cacccggcaa 1860
atttttact ttttgtagag acaaggtttc atcgaccggg cacggtggct caggcctgta 1920
atcccaccac tttgggaggc tgagatgggc ggatcacgag gtcaggagat cgagaccatc 1980
ctggctaaca cagtgaaacc ccatctctac taaaaataca aaaaaattag ccgggcatgg 2040
tggtgggcgc ctgtagtccc agctacttgg gaggctgagg ctgagcagga gaatggtgt 2100
gaacctggga ggcagagctt gcagtgagcc gagatcacac cactgcactc cagcctgggc 2160
aacagagcaa gacccgtct caaaaaaaaa aaagtttca tcatgttggc caggctggtc 2220
tcaaactcct gacctcaagt gatccgcctg cctcagcctc ctaaagtgct aggattacag 2280
gcatgagccc ctgagccag cctttgttct tttgtttatt caagggatta ggtaaggccc 2340
aaattgctta atgtagccaa gcaaggtccc attggccctt ctaatctcac tccttccctc 2400
cacatcatgt tgctgtctgc tctgatcaga ctttaaaata ctgctctagg ctgggcacgg 2460
tggctcatgc ctgtaatccc agcattttgg gaggtgcagg ctggcagatc acgaggtcag 2520
gagttcgaga ccatcctggc cagcatggtg aaaccctgtc tctactaaaa atacaaaaaa 2580
ttgctgctgg gtgtggtggt gggcgaaggt gcactgagcc aagatcatgc cactgctctc 2640
cagcctgggc gacaaaagga gactgcatct caaaaaaaaa aaaaaaaaaa aaagactac 2760
tctaaacacc accttctatg aaccttcaag cctttgcaca tgctgttttt ttctgccaga 2820
aactcccatc tttcctctct tcatctgtct acttccctat catctttcta agctctaaca 2880
tcacttcctc ggggatcctt cccccactgt gtccagacca gggagtccaa ggtggtctct 2940
agtagtttcc tcaatcatag cactgagcat accttatgct cacaacccat tctatgttct 3000
acagatcatc acatttccca gtgctcagca cttgctatgt agcaggtgtt caacagatat 3060
tatattctac ataagaataa ctgaactgga tggtatttag ttcaatataa gggggaactt 3120
cctaatagtc atagttgaac aataatggga acaggtggcc tcaggaggta atgagctccg 3180
```

```
tatcactgag tatacccaaa caggagctag atgaccattt ctcagggagg ctgtagggag 3240
atatccatac agaatttaag aatggggggca gtggctcaca cttttaatcc tagcacattg 3300
ggaagctgag gcaggtggat ctcttgagcc caggagttca ataccagcct gggcaacatg 3360
gcgagacgct gtctccaatt aaaaaaattaa aataaaacaa agaatggtgg gtggtagctc 3420
atacttgtaa tcccagcaca ttgggaggca gaggtaggag gatctcttca ggccaagagt 3480
tcaagatcag cctgggcaac atgcaacccc acctttacaa aaaataaaat actagccagg 3540
catggtgggc acatatctgt agtcccagat acttgggagg ctgaggtggg agaatcactt 3600
gagcccagga gtttgaggct gcagtgagct atgatcgcac ccctgcactc cagcctcaca 3660
acagagtgag actctgtctc tgaaagaaga ggccgggcac ggtggctcat gtctctaatc 3720
ccagcacttt gggaggctga ggcaggtgga tcatttgagg tcagcagttc gagaccagcc 3780
tggccaacat ggtgaaaccc catctctact aaaaatacaa aaattagccg ggtgtggtgg 3840
cacatgcctg taattccagc tacttgggat tacttgtaat ccagctact tgggattact 3900
tgaggcagga aaatcgcttg aacccaggag atggaggttg tagtgagcca agagtgtgcc 3960
attggactcc agcctgggtg atggagtaag actctgtctc aaaaaaaata aaataaataa 4020
aaataaataa aaaggaaga agaagcagga ggaggaagaa ggaagcaaaa agaagaagaa 4080
ataataatag tggagaatgc gcaaccttca gatctcctag ttctgactgt ttatatgacc 4140
cagcataagc ccttcccctc actaagcctc agactaccta tctgtaaaat ggaggtgata 4200
ggccagattt ctgaggggcc ctcctgctct aacaacccat ggtttcatga agaccagctt 4260
tgtgcccaga catgtaaggc atataccgaa ggacaagtta tttttttaacc aatggttggt 4320
gaatgagtga gtgttgaatt aatgaatgaa gtatgccttt tttgtcccaa tatcttgccc 4380
ataagccaaa tgaagagtaa ttcgaggttt gaaattgtgc aaactggcca ggcacagtgg 4440
ctcacgcctg taatcccagc actttgggag gtagaggcag gtggatcact tgaggccagg 4500
tgttccagat cagcctggcc aatatggtga accccacct ctactaaaaa tacaaaaatt 4560
agccgcatgg tggcacatgc ctgtagtccc agccactcag gaggctgagg caggagaatt 4620
gcttgaacct gggaggcaga ggttacagtg agccaagatt gcatcactgt actccagcct 4680
gggcgacaga gcaagactct gtctccctct ctaaaaataa ataaataaat aaaataaaatt 4740
gcacaaactt aggcttaaaa tcccagcccc tctatttccc agatgtggat cttggggaag 4800
tcactttgcc tcagtttctt catcttgaaa atggaccatt aatgtccagt tacagcctct 4860
tccccaggac gctgtgaggg agagatgtga cagtaaagtg cctagagcag gatgtagaaa 4920
gtggaccctc agaaaataag aaccccagcc tttctgctca catgggaggg cagggagctg 4980
aaataccttc tgcttatccc aaggcatttt cccccaccct tctctcctgt gccactcaga 5040
aagggtagga gctactttgg agagattttg attttatttta ttgtattgta taactatcaa 5100
aatctgccct aacaactgat acctaggctt tgtgacagga agccacaata acttttttctt 5160
gacctgcagc tgccctgcgg ataaaagata aaacaaagct ggggagccac tgagattatc 5220
aggcctgctg cacaggaaaa gggcagtatg cagcagggga cctgggctcc aggccccata 5280
ctcagaaacc tctgagggag gcagaggcag gtggatcact tgagcccagg aattcgagac 5340
cagcctgggc aacatggcca aatcccatct ctacaaaaaa tacaaaaatt agctgggtgt 5400
ggtggcgaac gcctctattc ctagctactg gggaggctga ggtgggaggg atgacctgag 5460
cccagggagg cggaggttgc agtaagcaga gatggtgcca ctgcactcca gcctaggtga 5520
cagagtgaga ctccatctca aaagagaaag aaagaaagaa agagagagag agaaagaaag 5580
aaagagagag agagaaagaa agaaagaaac ctctggcaag ctgtgtggtt aagccaagta 5640
actcaccctc tctggtcctc agtttccctg tttgcctact tcccatgtgt gaggttcaaa 5700
tcagattgtg caagcctgtg aacactgtag aaacaataat cattatgtaa gtgatcattt 5760
cgtcagcctt tgctctatgc caggcacggg acgagcgttc ttacaagagc tgcaaaatta 5820
gtttttagcag tattgttcct gttttacata tgagaaaacc taggctcagc gaggtcagat 5880
tccaaccaac ccaaatcacg catcttctcc tggcccttcg tttctctcg ggagacatgg 5940
cctccctact attgcataat tactttgtga agttaaagag cgttgggtgg aaatgagtgg 6000
gacagattgg agatgacgtg ggtgggggtgg gaggattcaa ggagggtacg cgcctggccg 6060
gactgggatg actctgcggc aggcctggga ctccctcagg ccgacccagg cttcccaagt 6120
ccctcctgga gccaagggcc cgggattctc gggcggctcg ggcgagcggg cggggcagga 6180
ggcggggcgg cggcaggaag ctgcccgagc ggcgctctga gcggcctgag cccggcggag 6240
ccctgcagaa cccggccgac ctccatgggc tgcggggggc tgcacccgga cccctggggc 6300
gcggcgcgcc cctgaatgca ccgtgggacg caggaggtag aggcgcacga ggcggcgcaa 6360
gagacatcgg gagggtcctg agcccctccg gggaggaacg cggtcctagg ctgagtgggt 6420
tgggggggaaa gcgatgctgg ctgggtcccc tggttcgcaa gacctcggac tgccagggggg 6480
tggggcctca ccgcgcccct ccctctccgg ttcgggcccc gccctcctc ctcctgcgcc 6540
gggctggggt acccctcctc cgggatccgg tacacagcgt cgcgcgctcc ccccagggtg 6600
ccatggcctc ccggctcctg caccggctgc ggccggcgac ggccccgggg 6660
aggcggcggc cagtccagag gccgagcagt ttccggagag ctcagagctg gaggacgacg 6720
acgccgaggg cctgtcctcc cgactcagcg gcaccctcag cttcaccagc gccgaggacg 6780
acgaggacga cgaggacgag gacgacgagg aggctggccc tgaccagctg cccctcgggg 6840
```

```
atgggacgtc aggagaagac gcaggcgagt gcaggaggac ggaggcggga accctggggc 6900
tcgattaggc ctccatccca gccgcgttcc cagagcatcc agggcgctaa gttgatccag 6960
ctgaaactcc cacacttctt aaagcgcctg ggccacctct tggctgtgtg accttgagag 7020
agtcttaacc cccctctgag ccaagttttc ccttgtgtca agtgggagaa ctcactctca 7080
tctcagaatt gctgcaggca ttaaatgtac agggcttggg atccgaatgg aaatgatgta 7140
ttaacgatat tttgagggtg gagctattaa tttagcccct actgtctgcc aggcacggtg 7200
tttggctcct cggtgcctct ctgtccctca gtttccattt ctgtaaaaag ggggtaagtc 7260
ctgcctcaca ctgggaggat gagtgaggcc acgtcagtgg ttgatgtcga ccctggccct 7320
aggcccattg atatgactgg tcatgtgtct gcagaacgga gccccccacc tgatgggcag 7380
tggggcagtc agctcctggc gcggcagctg caggatttct ggaagaagtc ccggaacacc 7440
ttggcacccc agcggctgct cttcgaagtg accagcgcta acgttgtcaa ggacccgccc 7500
tccaagtacg tggtgagtga gggtctagaa cccctgggct gtgagtccag aagtatggct 7560
aggagcaagt agggaagacc ccaacttcct gaggggtcta tgtagttata aatggttacc 7620
ttgtttacaa atggggaaac tgaggtcaga aaggggatgt aacttgagca aatcctcaca 7680
caagacttag tttccttgag actgactgaa gtggggatta aggaccttcc tcttaacctg 7740
gttttgagac taagagaact ggtgtgtgca cttccccacc cagcccacaa ggttttttgca 7800
aattgtagca agatgtgaga tacagagaga cagatgttat ctgggtcaaa cttgagatcc 7860
aagttgcatg ggctggtagt taaggaaata ggctttcgat ccagaccaat cttgactccc 7920
acttatttcc agttgtttga ctctgggtga gttgtttaac cttggtcatc ttccgtttcc 7980
tcattatagc aatggggaaa atgcagaaga ttacagcagg agttaaatga gacaatggac 8040
aaaaagccct tagcagtgtg cctggcatta tgacgtggtc aatgaaatgg tagctatgtc 8100
atcattattt aactttgggt tgaaaatgtt tgtcatctag ggcctgctgt gtccttataa 8160
cgcacaggtc aatcagttct caagcacccg accttgtccc taaggctag acttagaggg 8220
ttggtggagg ttaggatgaa gagcaatgtt ggggaggacc ttggagtccc ttgctgtttt 8280
ccttgctgtt gagagactga cttggagaat gaggtctgct cctttaatgc ccacagcgac 8340
tcctgctcca gtcccttttc aggccaggcc tgaaagccag ctgagctggc cactcctgtc 8400
agtggcagct ctccatctct cactcccctc ctcttcacca cccttctcca cctctgactc 8460
agcaggaggg ggcctggagc ccagtcccac atctgggcct ctccacccctt ttctgttgct 8520
gttagtaagc aagggccaca cccatggggt gactactcca atttcagcag ggaccgactc 8580
cgattattga gtctttttaaa aaaattttttg aggccgggcg tggtggctca cgcctgtaat 8640
cccagcactt tgggaagccg aggcgggcgg atcacgaggt cacgagacca tcctggataa 8700
cacggtgaaa ccccgtctct actaaaaata caaaaaaata gccgggcatg gtggcaggcg 8760
cctgtagtcc cagttacttg ggaggctgag gcaggagaat ggcgtgaacc caggaggcag 8820
agtttgcagt gagccgagat cgagccactg cagtccggcc tgggcaacag agcgagactc 8880
cgtctcaaaa aaaaaaaaa aaaaaaaaa aaattttgag acagggtctc gttctgtcac 8940
tcaggctgga gtgcagtggt gcagtcataa ctcactacaa cctccaactg ggctcaagct 9000
atcctcccac ctcagcctcc caagtagcta ggactacagc tgtgcaccac cacgtgtggc 9060
caatgatgaa gtctgaagtg gcaaaggtct cagaactctg ggttcataca ctggaagggg 9120
acaccaagga atagttcaga ggctgagagg aatggggggtg actgtgggta cctggatggg 9180
aagggatgac aagatagagc aggatggcca agtatgcccc ggcctgtgtc tggagaagca 9240
aggcacctcc tgtgtacaat ggggacccta attccccact caacttgtgg gggtgaagag 9300
cacaggcttt ggaatcagat caacctgagt ttaaatccca gctgggctgt tttccagctg 9360
tgtgacttac ggcaagtctt tgagcccttt tccccctctt tgagcctgct tcctcagctg 9420
tcagagataa ggaccttcct tgcagtgctg ttgtgatgat taaatgaaat cacagatgta 9480
aagagtgctt ggtacaacag gaggcacagg gtaaatgctt gggtaatgga actactgtca 9540
ttatcaccca tctggctgca tgttacaagg tcaatgagat aatggataca aaatgtaaac 9600
tagatgaaca taaaggctta ttatatagac cagtgtgtcc tgaagaaac tggtgtccta 9660
aagtgtgtcc tgcagaaaac tagttccctg gaatgttaat agctgtttct aaataaaggt 9720
tttgcaggca atatgttttg agaatgcaga gttaaatgag aatacaataa gtttctttat 9780
tgttaaagta tttaatccct aatagtgata tacactgtga atcttcaaga ggacagagta 9840
agcaaaccta actgaccagg agtggctaga gtattgtcag ttccacagaa caaatgtgag 9900
agaaagatct ggatttggtg ttagggtgcc tttaacatct aacactggtt aactctcctt 9960
ttaaacctgt tggcttggca ttataggtta atccatattc aggttctcag acctgggagg 10020
cggggaactt cgtgatcatc ttgttcagtg ttttccaaac ctcagtcatt ccaataccttc 10080
cctgattctt gtcctatcta aaaatgccac ttgtgtccctt ttcttcttaa cattttttctt 10140
taaatgaacc tatttttttt tctttatctt tttttttttc ttttttgaga cagagtcttg 10200
ctctgttgcc caggctggag tgcagtggtg caatctcagc tcactgcaac ctccacctcc 10260
taggttcaag caatcctccc gcctcagcct cctgagtagc taggattaca ggtgcccacc 10320
accatgcctg gctaacttttt gcattttcag tagagatggg gtttcactgt tggccaggct 10380
ggtcttgaac tcctgacctc aagtgatctg ccgcctcagc ctcccaaagt gttgggatta 10440
caggtgtgag ccactacgcc cagccgaacc tatttttttt cttaaataag tttatcgaga 10500
```

```
cggagtcttg ctctgtcgcc taggctggag tgcagtggcg tgatcatagc tcactgcagc 10560
cttgaactcg tgggctcaca tgattctctg cctcagcctc ctgagtagct gggaccacaa 10620
gtgcccaact aattcttttt cttttttcttt ttcttttttt tagagacagg gtcttgccat 10680
gttgcccagg ctggtctcga actcctggcc ttaagctgtt ctcctgcctc agcctcccaa 10740
agtactggga ttacaggtat gagccactgt gcccatcctt taagtaattt taaaagacaa 10800
cttcatagca ctaccgtacg tggaaagtct cacttgccac cgagagaagc tagccataaa 10860
aataaaaggt gaggcacggt ggctcacacc tgtaatcccc gcactttggg aggctgaggt 10920
gggcagatca cctgaggtca ggagttcaag accagcctgg ccaacacggt gaaaccccga 10980
cactactaaa aatacaaaaa ttagccggat gtggtggtag gcgcctgtaa tcccagctac 11040
tcgggagatt gaggcaggag aattgcttga acccaggagg cagaggttgc agtgagcgga 11100
gattgtgcca ctgcatgcca gcctgggcga cagggcgaga ctaaataaat aaataaagta 11160
aataagtaag tagtgaaaat gaaacgtcat taaatcttgc ctagatgttg ttgcctgaag 11220
gaggccctga cctgagatcc actttctgac tctttctaa aaatggagat gagaagtgtt 11280
agagaagtac ttttttttttt ttttttgag agagagtttc actcttggtg cccaggctcg 11340
agtgccatga gcaatctcgg ctcaccacaa cctccacctc ccaggttcaa gcaattctcc 11400
tgcctcagcc tcccaagtag ctgggattac aggcatgtgc caccacgcct ggctaatttt 11460
gcattttag tagagacagg gtttctccat gttggtcagc ctggtctcga actctcaacc 11520
tcaggtgatc cacctgcctc agcctcccaa agtgctgaga ttacaggtgt gtgtgtgagc 11580
cactgcaacc tgcccaagaa gtccttttttt taaaaccaaa ctgagagctg gccaggcgcg 11640
gtggctcaca cctataatcc cagcactctg ggaggcaaag gcgggcggat cacaaggtca 11700
ggagatcgag accatcctgg ctaacacagt gaaaccccgt ctctactaaa aatacaaaa 11760
aattagccgg gcgtagtggc aggcgcctgt agtcccagct actcgggagg ctgaggcagg 11820
agaatggagt gaacccagga ggcggagctt gcagtgagcc gagatcgtgc cactgtactc 11880
cagcactcca gcctgggcaa cagagcgaga ctccgtctca aaaaaaataa aaaataaaa 11940
aaaccccaac aaaaccaaac tgagagcttc tcaatttgta gtcagaaaga ttaaaaaaca 12000
attaggctgg gtgtggtgct catgcctgta atcttagcac tttgggaagc ctagctagga 12060
agattgttca aggccaggag ttcaaggcca gcctagcaa catagtgaga cccccctca 12120
tctccataca aaaaaaaaaa aaaaattttt tttaaatagc tgagtgtggt ggtgcatgcc 12180
tatagtccta gctacttggg aggctgaggc aggaggaatg cttcagccca ggaggttgaa 12240
gctgcagtaa gctatgattg taccagtgta ctccaacctg gccaacagtg agaccctgtc 12300
tcaaaaaata ataattaaaa ggggaccaac ctcctgatac agtgatattt actctagtgc 12360
acaccaccta aaaacctcag gtaccaatac ttgtacatgt ctcatttttg gacaaacact 12420
gacttgaccg agcacttcct tcactagaaa cagaagtgga cccagagggg gactcccttg 12480
cctgggtcac acagagaagg agtagctgac ctggggttag aacttgagtc ctaggccagt 12540
atactttttca cagttatggc agttgtggct atctacagac ctgtcctctg ggtctagttt 12600
ggaaaagcct gaccagggat gtggaggcca ggtgtccaaa gtggaacaag ctccaagctg 12660
gtcctaaagg agccccaaga gattggctgg ggtttcagct tatgtctggt tttccagagg 12720
gggctgtcag aagaactaat gctctatggg aagggagtac aaaaaaaggg gcagcagccc 12780
cgggcactga agctcatctc tgtctttctc tcttcttgct gccttgggcc tgggtcattt 12840
cagacaaacc tcaggtaaga tgggactggg cttccccgcc actgcgcagc agctcccgcc 12900
ctcctgggtg ctgtcccagg ggtgaaagga agaggtgggg aggtacagct gggagtgtgg 12960
gggatgggga aggatgggga gggaacgggc ccgtggacaa cttgcatttg ccctgacacc 13020
caccctccct gcagctctac accctcgccg tgatcggccc aggaccgcca gattgccagc 13080
cagcccagat ctctcgccgt tactcggact ttgagcggct gcaccgaaac ctgcagcggc 13140
aattccgggg cccaatggct gccatctcct tcccccgtaa gcggctgcgc cggaattta 13200
ctgcagagac cattgcccgc cgtagccggg cctttgagca gttttttgggt cacctgcagg 13260
cagtgcctga gctgcgccat gccccggacc tgcaggactt cttcgtgctg ccggagctgc 13320
ggcgggcaca gagcctcacc tgtactggcc tctatcgtga ggctctggcca ctctgggcca 13380
atgcctggca gctgcaagcc cagctgggca cccctctgg cccatggagag gcccgggcat 13440
ccctggctgg gctggccgtg tgccaccagg agctggaaga ccacccttttg ctggcaccct 13500
gctgtgagaa ggccctgcag ctgcttgggg acaagagcct ccacccttttg ctggcaccct 13560
ttctggaggc ccatgtccgg ctctcctggc gcctgggcac accacccccc agtctcaaag 13620
ctcggctcca agccctgcag gaggcaggcc ttacccccac accacccccc agtctcaaag 13680
aattgctcat caaggaggtg ctggactaac ccttgcctag atttaaggcc actgtgagga 13740
gagggggttgc cccagaaggc aggggaagga cctgatgaga acagaatagc tgggaggctg 13800
cagagggtgc tgggagcccc tagaagttcc aaaagagaat gtgaagcaga tcaaggaaac 13860
ttctgttgag ctaggctcag ggtgagcttt ggctggggtt gcccttgtgt agtacaggga 13920
agtctgacac agcctctcca gcctataaac agccgggggg ctgtggcaca ggttggggca 13980
atgttccctt gttggtgggc ccccaagctg gcaaggcctc ttggctgaag gccagggact 14040
ctgcccctgg agtcctggag ttaagggatg aaggcaaggc tgcaggtctg gcccagggga 14100
attaaaagcc agccactcca gtggtatcag tctctttatt ggatgtgagg gccaaaaggg 14160
```

69

```
actgtaactc ctgtctcagg aatgggggata gatgggaggt tcttgaagcc ccaggcgaag 14220
ctggtacctc tggctacagc ttgctctctg agacctgggg cttcactcgg atcacgccct 14280
cctgggcaca ggtcacagct aggactccat cctgacgcca cagccgccca tggaccagcc 14340
cccgagagcc acctgtgggt gaggtgaagg gtgatgatgg cctgcttcag aacagccaaa 14400
tacacttttt ttttttttcc tgaaacagag tctcactaag ttgccaggct ggtctcaagc 14460
gcctgggttc aagggatcct cccgcctcag cctcctgagc agctgggatt acaggcgcac 14520
atcaccatgc ccaacctcca agtggacttc ttgcaaaggg tctggcccag ggcagggctg 14580
ccccacacaa gggtgcactg agtgtcgtgg ctgctccaaa tgccccttca tgagcttatt 14640
atggaccgtc attgaggggt aactcctccc acaggaaccc cagttgacag tttaaaagca 14700
ctttcacacc tctcctcgct tcctcaaaaa gatcacagag ggaggagctc tgagaacagt 14760
ctccttcaac agttcggcca agcagaactg ctgtacctct gaccacttgt gttaggaaaa 14820
ctatcggctc cctgtataat aaatcaagcc aggtcctcca agtggtaatt catgaaaaat 14880
atccccacta ccaccaccaa ggggaagaaa ggactcagaa gagaggactt gaggccatga 14940
ggtctggcct cttccctccc catctggaga ctctttctcc cttgctggct ttgggcccaa 15000
gtttgatgtt tatgaggatg attgctggtt tcccttacac atagcagagc tcactcagtt 15060
ctcacagtag ccaaatgaag cagttatgtg ttgtccagtt ttccagacca ggactgaaat 15120
ccagagaggg tcaggaattt ggccccatga tgaagccaaa tctgaaccca tgtcctcact 15180
tcaaggttat caatcttgga ttgtgatgct attggtactt gagaataccc cttatctgag 15240
tataaagaat ccttgagttt tgtccttggt ttatcaagca aagcttttct tcatttgaaa 15300
tgtactccct tggaaaggag gtcaggggttc tgaagctaga cattgatgaa cgagtcttgt 15360
ttctctcccc tgcaaggaag gtccaagcag gcccttaggg accactgaat gccccgatcc 15420
caatcaggtt aatcagaatc acttagagaa cttaaaaata cagtttcctg gaccttatcc 15480
aagacctact gagtgagaat cttgagggtg gaatcagaat ctattttgaa aaggcatccc 15540
caaatggcag tctgatggac tgcgggtttg gataccactg ctgtaatgta accctctttg 15600
tttagatgag gaaactgagg ttcagatgga agatatgatt tgcctattgt aatacaaaga 15660
atctgaactg gttttgggac tagaactggg tccctgggag aaggtgaatc acatttccag 15720
cacattctag aaatttagag cagagcaggt gtcccggcct caccctctca tttttgaagat 15780
gaagatgcca aagcctggga gggaaggaaa ggaagtgacc tgtgcagcgc cacacaggaa 15840
gtcgggaaat cagcatcacc caagaaagca ggctcctgcc actcaaggtc agtgcccttg 15900
tcccacacgg ccccacactc accggcccag gggctctcgc attcatagag catccagtgg 15960
tcagctcgga aggggggcgtg gaaccacatg gaatggtcca gtgagaccat gaagtgcacc 16020
ttgtgctgcc actggtgagg cagcagtgca gtgcccaaga aggcatagtc ggagatatag 16080
gcggccacgc agcagtgcat cttcatgtcg ccctcgcctg caacaggtcc ccatcagccc 16140
tgggctcctg ggctttccag ctcaggacct gcacggaggt agggggaaaa gggactcccg 16200
tgcatgggtg tgcagactgg ttgctgcaca agagcgcttg gcctacagtg tgtgtgtgtg 16260
ataggggaga agtgagatgg cgacttgggg agggcagggg tgagcaggga ctgaaattca 16320
gtcttcacca cccaagtctc ccactctagg ccccaaaagg ggtgtcttct tccaatttgc 16380
acaaagatac tttatagtta gcagcaaagc tggacaacaa ccccagcgag gtgccttttg 16440
ccttcctcag aaaggccttg tgtcgggatt atagtcatct ccaccttctc cccatgcaaa 16500
gggctgagag ggcccaggtg agaagctaag ccaacttccc catcatgcag ataaggaaac 16560
aggcccagag aagggaactc atgtgcccaa ggccacacag caaatgagtg gtagacccct 16620
tggagagtgg tttcctccca tccatggggt actcttacca atatagcccc gggctcgcac 16680
ccagaacatc tgtttgggct ccattctctg cagctggctc aggggggatg ggtttactgg 16740
cttgatctca atggggacct cctgagcagc aattcggttg agcgccaatg ggtacctctt 16800
ttggaggtta gggtccctga aagtaaaggg aagagggtcg gggtgagacc caggaagaga 16860
gggagtcaca tctgcattgc ctcttctgac tcccctcatt cttccacagg gacccctgat 16920
atccccaaag ctcccctccc ctgtggcagg caggatagta cagcgtttga atcccttctt 16980
ggccacttac gagccatgtg gtctcgtgct aattagtaat ctgagtctat tttcccatct 17040
gcaaaatgtg gataatgata gtaacctacc tcataaccaa cactgtgaag acaagatcat 17100
gaatatctaa ccaacacatc atagtaataa ggcataccct gtaaatatgca ctgttctaag 17160
cattgtacat acaatagtat tcctcacaac aaccctgtga gataggtact attatcaccc 17220
ccatttcatc agtgaaataa gcacagagtc caggtagctt gcttaaaaat tggagagaca 17280
ggatttggac tcaggcaatc tgggtccaca gtatgattat tttctatttt tttagagaca 17340
aggtcgtctt ctcacccagg ctggagtaca gtggcgcaat cagctcactg cagtctccaa 17400
ctcccaggct caagccatcc tcttgccttg gcctcccgag tagctgggac tagaggtgta 17460
cgccactgtg cctggctaac atttttatta tttctttatt ttgagacgga gtctagctct 17520
gtcacccagg cttgagtgcg gtggtgcaat ctcagctgac tgcaacctcc gcctcccagg 17580
ttcaagtgat tctcctgcct cagccttaga agtagctggg attacaggcg cctgccacca 17640
tgcccagcta attttttgtat gttagtaga gatgggggttt cactgtgttg gccagggtgg 17700
tctcgaattc ctgacctcat gatccgcccg cctcagcctc caaaatgct gggattattt 17760
ttactttttt ttgtagagat ggggtctctt tatgttgccc aggctggtct caaaatcctg 17820
```

```
gccttaagtg atcctcctac ttcagcctcc caaagtgctg ggattacagg agtgagctgc 17880
tgtgcccagc cacttcatta ttttaaacac tcaagaaaca ggctgcctga cttggcctga 17940
gttaccaaac cctacacagt agggaacatt gcatcccccc agggggagga gcccattcca 18000
aggaactccc ttcaatacag tgacaaccac ccatagtgct ctgcacaggt cctgccattt 18060
tcacccctat cctctggagt gctgttggac agaacctcct atgatgatgg aatgcctatc 18120
tgcacagcac actatggtag ccactagcca catgtgacta tggagcacct gaaatgtggc 18180
taatgcaact gaggaacaga attgttcatt ctactgactt tggttttttt ttgttttttt 18240
ttttttaaga cggaatctcg ctctgttgcc cagtcaggag tgcagtgact caatcttgct 18300
tactgcaacc tctgccccct gggtccaagc gactctcctg cctcagcctc ctgagtagct 18360
gggattacag gcacgggcca ccacgcctgg ctaatttttt tgtgtgtgta tttttaatag 18420
agatgaggtt tcaccatgtt ggccaggctg gtctcaaact cctgaccttg ggtgagccac 18480
ccgccttggc ctcccaaagt actgggatta caggcatgaa ccactgcgcc cggacctatt 18540
taattttaat taatgtaata tagccacgag tggctagaga ctaccttatt aacagcacag 18600
atctaaattc aaggtccttt aacaatgtct tcctttcatt tcagcaaaca tttgtcgaac 18660
tgcaaccaca caccaggccc tgtgtttttt ctgttaatag tgatataact acaattcact 18720
gccattgtgc tagttagtac tagcacgcta agtgcctttt ctctcttatt taatcctcac 18780
agcagcctta tgaggtagga atatgattag caccatttta taatggtgag tactggctca 18840
gagtgggaaa gcaacttgcc caaactcaca cagctagtag ggacaaaatc tagaattgaa 18900
tccaggcctt tcaggttccc aaacccacat ccatcccgtc atactctgct gcctccccag 18960
tatctaacac gagatagaga cattctctcc ttatgataca gctaagaagt aggcagggca 19020
gaaatgagca ttcccatttt ttagaagaag aaactagggc cctggggagt tgggcactgt 19080
cccacagcag gtgagcattc acagaggcac agccctggac agaatccatg tgtctatcct 19140
ttgtctggac ccagagctct ttcccctgta ccagcatttt tcaaacttga ttaggtgtga 19200
tccaaataaa tatattttac caggtattca aaatatctaa catgctccct ggtggtctaa 19260
tggttagggg aaaatacata tttgtatttt tgtacatatg ttttatatac ataaaacatg 19320
tggccgggca cggtggctca cgcctgtaat cccagcactt tgagagacca aggcaggtcg 19380
atcacttgag gtcaggagtt caagaccagc ctggtcaaca tagcgaaacc tggtctctac 19440
taaaaaaata caaaaattag ccaggcatgg tggcatgtgc ctgtaatcac agctgcttgg 19500
gaggctgagg cacgggaatt gcttgaacct gggaggcaga ggttgcagtg agccgagatc 19560
atgccactgc actccagcct aggcaacagg gcgagactct gtctcaaaac aaacaaacaa 19620
acaaaaacat gcactaatgc aaaggcagtg accaaacata ggccatagcg ctgcagctct 19680
ccagaggaca ctcactcctg gtgtgcatta agtcctaagt tgctggacca ggggcctggg 19740
ggagagaggg aatcacttag ggggctgggg aggtggtact aacaagtgg ttacggaagt 19800
atttctatat acatatatat ataaaatata tatatggttt tttttcccag gtatggtggc 19860
tcatgcctat aatcccagca ctttaggagg tcaaggtggg tggatcacct gagatcaaga 19920
gtttgagacc agcctggata gcatggtgaa acgccatctc tactaaaaat acaaaattag 19980
ctgggcatgg tagcaggtgc ctgtaatccc agctacttgg gaggctgagg cgggaggatc 20040
acttgagtct gggagtcaga ggctgcagtg agccgagatg gtgtcactgc actccagcct 20100
gggcaacaag agcaagactc catctcaaaa acaaacaaac atgtatatat ataaacaaca 20160
acaaaatata tattcttttt ttcttttttc agacagagtc ttgctcttgt tgcccaggct 20220
ggagcacagt aacacgatct cggctcactg cagcctccac ctcccaggct caagtgatcc 20280
ccccgcctca gcctcccaag tagctgggac tacagacaca tgccccgaca cccggctaat 20340
ttttgtattt tttatagaga cagggtttca ccatgttgcc caggctggtc ttgaactcct 20400
gggctcaggt gatcctccca cttgggcttc ccaaagtgtt attataggta tgagccccca 20460
cacccagccc cagccttatt tttaaattag agatggagtc ttgctatgtt ggcgaggcta 20520
gtatccaact cctggtctca gcaatcctc ctgccttggc ttcccaaagt gctgggatta 20580
taggtatgcg ccactgcacc cggccaagcc cttcatttta taccatgacc cagtacagac 20640
acacaccaga aacacacatg actaaacctc aagtttcaca aaaggattct tgcccttaat 20700
acatacatat tattcactcc agtatcttct tttctaatct gtattttaaa aatgctggtc 20760
aagacccact aaaggattct atgacccaca aacagatagc agctggcattt tgaaaagtct 20820
gccatggagc ctccaggtct ctcaccttaa atactggtca atgagggtct cacagtcaag 20880
cagctcttct ggtggtggca cagtggggcat ggagaactgg tgctgcatgg ggctgggctg 20940
ggcctgctgg aaggaggcct ggcagatgaa gatgggcttc ccatgttgca cggccttcac 21000
agagcgcacc gagaagctcg accctgttcg tgtccgctcc acttggtaca gtactggcag 21060
cttcgggtcc cctgcagtgg gcacaaggac acagtgggtc cacaggccct gtcatcatca 21120
caacgcctga caggcactct actactcatc ttccattcca tttcatctca gtgactacta 21180
actgaggtct gctaaggtcc aggcccaggg atacagagac caccaggccc tgtcatcagg 21240
cttctccctg tgcaggtgga gcttttctct aacagcacaa acagcagaga cattgacaga 21300
ttccttgcat tcaaatcctg gctccaccac tcaccagccg tgtgaccctt cacttctctg 21360
agcagtgtgc ttatttgcaa actggggatc atcatggtgc tcatcgctta caggattttta 21420
atgataatga aatgaatccg tagttgtaaa gtgtttagaa taatatctgg cacatagtga 21480
```

```
gggctctata tgtgtttgtt aaataaaatt aatactcctt gcttctatct tgctccatct 21540
atgcctggga tcttgtcatc agtccaaaac cattattcta gatcaggag cagtaaatct 21600
agcctgcagc ctgtttactg tttattctgt tgttgttttc ttttttgaga acaaacaaag 21660
gctatttatt cagcgcttgt tctttttttt gtttgtttga gatggagtct tgctctgtca 21720
cccaggctgg agtacagtgg tgtaatctcg gctcactgca acctccacct ctcaggttca 21780
agcgattcct gtgactcagc ctcctgagtg gggggggact acaggggtgc atgaccatac 21840
ccagctaatt ttttttttttt ttttgagaga cagtttcgct gggtcaccga ggctgaagtg 21900
cagtggcgct atctgggctc actgcaacct ctgcctccca ggttcaagcc atgctcatgc 21960
ctcagcctcc taagtagctg ggactacagg cgtgcgccgc tacacccaac aaattttttgt 22020
attttttgta gagatggggt ttcactgtgt tgcccaggct ggtctcaaac tcctgacctc 22080
aactgatcca cccaccttgg cctcccaaag tgttgagatt acaggcatga gccactgcgc 22140
ccagccaatc agagcttgtt gtagcaggaa gtcaaccacc atcacttgct tttggcagag 22200
acttagaggc aggcaaagga atgggaatgc tctgtagtgg aaaaaaaggc ttcagggatg 22260
ctcccattgc aggctgttgg catggggaag ctgttggtgg gctaactaga agcatgacac 22320
ctggctgggc acggtggctc acacctgtaa tcccaacact ttgggaggct gaggcgggca 22380
gatcttctga gaccaggagt tcaagaccag cctggccaac atggcaaaac cctgtctcta 22440
ctaaaaatac aaaaaattag ccaggcctgg tggcacacac ctgtaatcct agctactcgg 22500
gaggctgcag caggagaatt gcttgaagct gggaggtgga ggctatggca ggagaactgc 22560
ttgaacctgg gaggtggagg ctgcagtgag ccgaaattgc accactgcac tccagcctgg 22620
ggaacaagag tgaaactctg tctcaaaaaa gagtgggaca tcctatgtga ttggttagga 22680
gtacatattt ggctttctcc ggttggtcct aagttggaag caggggcaaa aattagggca 22740
gctatcagtt attaatcaag tcctggcttt ggaggccaat tgttacagtg gtcattattt 22800
ggcttgctgg actggttggt aaagatagtg gtctgacttc ctacaagtct gacttgtgga 22860
tagtaggctg gcttcctgtg ctggttgctg ctattgtgcg tcagagttct gtttttctac 22920
atggtctagc cattgtctgt ttgtatattc agcctctccc aggcaagggc cactgtcagt 22980
cacttcaccc ctgatgtata tggaagccat ttggtccttc actgtcaggt gtctctgctc 23040
caaagcagag tggaagagcc taggcaacac agggagaccc tgtttctaca aaaataaaa 23100
aataaaaatt agctggacat ggtggcatgt gcctatagtc ccagctaatc aagaggctga 23160
ggcggaagga tcacttgagg ccaggagatc aaggctgcag tgagccatga ctgcgtcact 23220
gtgctccagc ctaggtgaca gagcaagacc ttgtctcaaa aacaacaaga ccaccaccac 23280
cagagtagaa ggcactggcc agggataagg cagccaacaa caagcaggtg agggaagatt 23340
tggagaggaa gagaacttcc ctggtttccc tgaagttctc actttgtctg agtcaggctg 23400
accttgagga accctgacat ctgggccatg agacatcttg gggatgactt tcaaccttca 23460
gatgaaagaa gcaggtctag agaagtgttg cttccttcac tctgatccaa atggggagtc 23520
aaccaggcac cagggctcaa tcaacagcaa taaacatcac tgtctgaggt caactggctt 23580
gctcagctct ctgttatcag gcactgccac cagcagcact tctatcagag tgcgagctcc 23640
tcaaggttaa aggcatttga gaagggctta ccaagagtcc agacactaga caaagttact 23700
tgtgcagtct gctttcagac actgggaatg aagtcttcct ccctaccacc aaacttgggg 23760
ggaaaaaaca aaaaaaaacc tctaatccaa tccttggtct gcaggtaagc taaagtgcag 23820
attcctgagg aggatcacag aaacttcagt actctggtct acctttcagt gtgaatgagt 23880
tccagcccta ttcttgaaaa ttgttattgg aacagagcag gtaggccctg aggcatattg 23940
aagggagtta atgattatgg agtgatgcag ggtgcctgac agcattggac aggagggtat 24000
gttttctcat gttggtctca caataactat gtagagccac tcttaccccc attgtacaga 24060
tgaggaaact gttgccttaa aatacaattt ttttgtaata aagtcatgct aatttgttta 24120
catattgtct atagttgctt tcactggcaa aacctaaaat gtttactatc tggcccttc 24180
tagaatgttt gctgacttg ttctgaattc ttcaagctct aaatttacct ctgtagagaa 24240
aaactaaaaa caaacaaaa acccaactaa ttcacattct ttcctgggct tttagaaaaa 24300
gaactgattt gataaatggc caaggaccaa ccctccccct cccccataac atcttttatt 24360
tttaaaatgt aattgaaaca tctcttttttt gttttgtttt tttgagatgg agtctcgatc 24420
tgtcgcccag gtgggagtgc agtggcgcag tttagctca ctgcgacctc cagccgccgg 24480
gttcaagcaa ttctccttgc ctcagcctca gcctcccgag tagc tgggatcacg 24540
ggctaaggtc accacgccca gctaatttttc cttttttttt ttagatggag tcttgctctg 24600
tcacccaggc tggagtcag tagcctcctga gtagctagga ctacaggtgt gcaccaccac 24660
tcaagcgatt ctcctgactc agcctcctga gtagctagga ctacaggtgt gcaccaccac 24720
acctggctaa ttttttgtgtg tgttttttttt ttttagtaga gatggagttt cgccacattg 24780
tccagcctgg tctcgaactc ttgacctcag ccgatctgcc cgcctcggcc tcccaaagtc 24840
ctgggattac aggcataagc cacatgccca gccaaaaaac agcattggtt ttaatatctg 24900
atatagctgg cagagtcaca ccacaaacag ataagagctc tcccctttttt gccttgcagc 24960
caggaagctc agaactaaac cttgtatgaa actgcaacaa tatggcttag ccaaatttttt 25020
tgacatgatc gcttctccca aatcccatta ctactggcct aatgtccttt gacttttaat 25080
attcccataa taactaccaa ttattttagc tatcttgcag cctttcaaga cacaagcaag 25140
```

```
ggcacaaata attattttta tttatttatt tattttgat ggagacaaga gtctcgctct 25200
gtcgcccagg ctggagtaca gtagcatgat ctcagctcac tgcaacctcc gcctcctgag 25260
ttcaagcaat tctcctacct cagcctcctg agtagctggg actacaggca catgccgcca 25320
tgcctggcta atttttagta ttttagtaga gactgggttt caccatgttg cccaggctgg 25380
tctcgaactc ctgagctcag gtgatccgcc cgcctcggct tcccaaagtg ctaggattac 25440
aggcatgagc caccacgccc ggccaaataa ttatttattt tgaaatggtg gcttggacac 25500
agctcatttc acgctgctcc tggatgaaga ctttccaaga aagaggatct tttccccaga 25560
acctgggatg ggtaccctgg cagctctctc attgtttaga attattgccc aagagcgaag 25620
caaagaagca ggaaagagtt tggcactcaa agacacataa accaggttca aatcctggct 25680
ctgcctcctt gggcactgtg ggagctggtt ccaaacctct tcaggtccca gtttccttag 25740
gtaagaatga tggcaggaat gcctgccacc catgtttact tatgaagact aaacaagata 25800
atgcacacaa ctatgctctg tatcatgcaa attttaatta ttcccataag ttaatcatca 25860
aaaactaata atatttatgg aaaactagat tatgccaagc cctgcactag atactttact 25920
ggcaaagact cattgaattc ttccatcaca ggatgaagag attcagagtt caagtaatgc 25980
ccccacccac acaaaagaaa acagccaggt atttcactag gctggaagga ttacaatatc 26040
aaaaggctgg tacttacaaa caaattaaag aaacaaagca catatttact cccaactagc 26100
ataaagataa gaacctggct gagcccaagg taagtattca aatactttat agcagtgact 26160
gggggccgag aagaggggggg ccaatcaata ctcctcaggg atgaggagta agagacacgg 26220
gacagtatga aaaagtgtat ttaccattac agggataact ttcatattta caaaatgaag 26280
ggggaaaccc catggttttc ttaatacaaa tcacatactg taaaggtcca caaactcttc 26340
tcagctgggg atctacgcag aacacatgag ggcatctgct ctgggggtaa cagggaagga 26400
aagaaaacag tgagggtttt ttttgtttgt ttttagcat aggttttgct tttatttcc 26460
ttttatttat ttttttgtag agacaaggtc tcgatttatt gccctggctg gtcttgaatt 26520
cctgggttcc aacaattctc cgcattggcc tcccaatgtg cggggattat aggcatgagc 26580
caccacacat aggttttttg tttttgagac agagtctcgc tctgttgccc aggctggagt 26640
gctcgcccag gctggagtgc agtggcacga tcttggctca ctgcaagctc cgccttccgg 26700
gttcacacca ttctcctgcc tcagcctccc gagtagctgg gactacaggc acccaccacc 26760
acacctggct aatttttttta tatttttagt agagacgggg tttcaccgtg ttagctagga 26820
tggtcccgat ctcctgacct cgtgatccgc ccgccttggc ctccaaagtg ctgggattac 26880
aggcgtgagc caccgcgccc ggcctcacac ataggtttta agttacatta tctgacccca 26940
gagctgtaag aagctgtaga gatcatccca ctaaaatacc cttggtccca cccttctcca 27000
ttttacagct gaagtaaacc aaactgtagg gcggggaggt aacctcacaa ggctgcatgg 27060
taaattatgg acaaaactga agctaggccc tacatctttg gtttgttttt attgaccta 27120
tgctcagttg acaaaagaag ccttagatcc cttgactctc aggctggtgc tctcttctcc 27180
aacccaagct gccctacctc cacacctcta gcacagaggt cacagcacac tgagaaccta 27240
gcacagcgct ccgcaccagg agctatgtta agaatggaag aacaaaagcc cacaaggagc 27300
agttaagcaa caaagtcttg tgtcattatc agccagacat caggtaccca gtgagtccca 27360
gcaggtgtga ggtccaaggc tcattgttag ccccagacct cgttccaccc tagacacctc 27420
ttagggtggt agtgtccgcc accccctcccc ttgtcttcca gtctccctct cttccctttt 27480
gacctcagcc cccaaggcca gaaatggctg ctgggccacc agggttgggt tggggcagga 27540
agtgggggggt ttacctgccc gaacaaagta gcagtgcagg gagtgcacgt ggacgtcttc 27600
actcacagac ttggctgcag ccaccagggc ctggcccacg atctgaccac caaacagcct 27660
cttggccggt acccagtaat gccttcctct gtagggagag ggggaaagag ggaaagactt 27720
gggaactggg ccaaattcta ctaccctcac taagactcta atgcatgatc tcttcaccat 27780
attggggttt aagatccttt tgagaatatg gtaaaagcca taggtccttt ccccaggcaa 27840
atatccttat gcataaaaat cctctgggcc gggcgcagtg gcttacatct gtaatcccag 27900
cactttggga ggccgaggca ggtggatcat ttgagatcag gagttcaaga gcagcctggc 27960
caacatggtg aaactccatc tctactaaaa atacaaaaat tagctggacg tggtggcatg 28020
cacctgtaat cccagctact caggaggctg aggcaggaga atcacttgaa cccaggaggc 28080
agaggttgag gtgagccaag atcgcaccac tgcactccag cctgggtgac agagcaagac 28140
tccatctcaa aaaataaaat taaataaatg tataaatgaa taaataacaa gagccctcag 28200
acatcaagtc taactccttc agtgtacaga tgagaaaact gcagcttggc cccagagatg 28260
aaaatgcttg cccagaatgt aggcccattg gaagctgaat aattatgtct ctagcctccc 28320
acgtcccagc tgtttggcat tttctgtaac aatgagttat gaacagccct ccatgacctg 28380
gcaggtggct ctcgcctgta atcaatccca gcactttggg aagccgaggt gggaggatcg 28440
cctgagccca tgagttcaaa accagcctgg gctccaaagt ggggcctcat gtctactaaa 28500
aataaaaaag ttagctggat gtggtggcaa gcgcttatgg tcccagctaa acgggagact 28560
gaggcagaag ggtcacttgg gcccaggagg tcgaggttgc agtgagccat gttcgtgcca 28620
ctgcactcca gcctggacaa caggccaga tcttgtcttc aaaaacaaaa atcaaatagc 28680
cctccaagaa gttatttaca attccttaag tggaaggaag ggagctcaaa gtaagataac 28740
ttccagtaaa gccaggagaa gccttggagg tcaaagctgt tagaagcctt gctgcagggg 28800
```

```
gctgggcgcg gtggctcatg cctgtaatcc tagcactttg gcagaggtgg gcagattaca 28860
aggtcaggag ttcgagacca gcctggccaa cacggtgaaa ccccgtctct actaaaagaa 28920
gttaaaaaat tagctgggct gtggcgcgcc tgtatgtccc agctaatcag gaggctgagg 28980
caggagaaat gcttgaaccc gggaggcgga ggttgcactg agccgagatc gcaccactgc 29040
actccagcct gggcaacaga gcaagactcc gcctcaaaga aagaaagaaa cccttgctgc 29100
agtcaagaac ttcagcgatg ctgggaaaga aaaaaacatg cttaggcctc agaataagta 29160
atgagaaacc agacccacca aatggtactg ggggcgggat attgtgagaa gaaaaggata 29220
ctgaagacac aaggagctgc ggcgtcggtt ttaaggctga tccatcagct gtgtgccctt 29280
gggcaaatca ctgccctctc tgggctagct cccccgtgaa ggcttagggc aggctgccga 29340
gcagggtctc tcaggtcacc actatatttg ctcagctgtg cagacctcgc agcgcggaga 29400
ggaagggagg aagccagagc agagaggaca gctctgttgg gggcgagttc tctcctaatc 29460
gtggcagagg gtgcatccca cgcagagcca tactagtccc ggagccaggg gccccgggcg 29520
gcggcagtca agatcaagtt tctgccctaa aggaggggat gctgggcagg agctgccggc 29580
tacctgaaga gatcctcgtc cagcggctcg aggttgagca cggtcgtgac caagacgcta 29640
cggaggtccc cagggggatc gccgcggtcg ccacagccct gcccatcttc tggggcctgc 29700
ggggacgaca tctagttcaa tgctgcaggc cctgcacacc cgctccgcgg aagacgcgga 29760
gacatacaca gaacctgact cttccggcag attgccctag taaccggaag tctcctgcag 29820
accccgggaa ggaggaatct aggttatgat tggtcaggac tcctgtcagt ccgctggtgg 29880
ctgtggccct ctttctctag caattggaga aaatgaatgc caatctgcga atcctgtgtg 29940
tgactggata tgtcgctgag gaggcggaac ctcgggactg gataatatgg actgagtgtc 30000
atttcccctg tcagatagca aatacacccc cttcctcttg taacccggtc aggcctaggg 30060
ttcctccctg agttccagaa taggccaccc agttggggcg gacccttaag gcattctggg 30120
cccacgcctg cctataaacc ctcatagtgt gacctttgac ccctggtgtg atcttgggcc 30180
cgggctggga ccagccccta gtgtgggttg tggggcggc catggagctg ggcagctgct 30240
tcaagaccta tgaggacttc aaggagtgct tcagcgccta caaaagggag aacaggtgct 30300
ccttcattct cagggactgc gtctccgtcc gcttccacaa cctcaaccat ggcacctcca 30360
tccgcgaaga catcctgtaa gggcgggcgg ggcggggcgg gccaagaggg tggggaggag 30420
gctggacctc cggagggctg cctggaggag gaggggtgca taggcacgca ttgggctgcg 30480
tggccattca ttcaacaggc actcattgag cacctgctgt gtgccttgtg aagagagcta 30540
agcctccacg gccattggtt tttgaccacc cactccactt tcactccatt cacaggcttt 30600
tctggaattt ataactgcag tttctcccat tgttttgagc agctgcagca acccaaatac 30660
aaagtatggc tttcataaac ggataaaaac accttggcga taatttcctt catcagtctc 30720
ctctttacaa aacagtcaca tggtcgttgg aatgttcgtt cattcattca ttcagttttt 30780
agttcttata tatttgttga aacagggtct cactctgtcc cccaggctgg agtgcagtgg 30840
cacaatcagc tcactgagcc ttcaactgct gggctcaagc gatcctccca cctcagcctc 30900
tcaagtagtt ggaactggag gtgcacgcca ccatgcctgg ctaattattt gattttgtac 30960
agactgggtc ttgttatgtt ggctaggctg ttcccagact cctggactaa gcgatctttc 31020
ggcgtctcaa agtgttagga ttacaggcat gagccactat gcctggtcta ttcattcatt 31080
ttgtaaatgg tttttgagct ccttatatta accgttttca aacactttcc atgtgccagg 31140
cagtgttctc tatgcatgct ttaccctgca gggctttttt ttcagaatta tagataaatg 31200
ttattttttt gcatttgaca gatgagaaga tttgacagat gagaagtcag gcttagaggt 31260
taagacagga gttgaaaact caaatgcctt cagggattag gtgaaacaac ccaatgtaag 31320
aaagttttaa cttttgaattt tactttaaga aaaagaatga tgaaatagca accaacacca 31380
ggtctttgtg ctagggacaa cagaagtgtg aaatgggcca aatggagagt agatgccatc 31440
taatcagctc cagctgatgg ctgccatatg aaaataaaga tctagtgttg ccagaatttt 31500
gggcaagagt tgtcagaaat ccacacttta tgtggatttt cccatttaaa aaaattgaat 31560
cagttcaaat tttaactcag agcatgcggg ccaactcaga gttaaagcat atccgagttt 31620
gagacttgga ttgagatgct caaccaaagc tcctcaatta gacagccagg ctatattctt 31680
tccactgttc tgaagtccag tgctatgctg ggtataggtg acataaagat gaataagtgt 31740
tcaaactatc cccagagaac taggataaac ttgaactcaa gcaaactggt gtgtgataaa 31800
tgctttaaaa ggaatgtgga aaaaaaaaa aaaaagaaa tgtacgagga aagaaatgaa 31860
tgacaaatgc ctgggaggtg ggggaagtct tcacactgga attgatggt tccctgggct 31920
gtgaatgaat gtagagtgct agagtagatc tgtggttaat tactgagtac catggaggca 31980
tttgaccaga agttgctgtg cagaaggacc tacaggagca aagacaaaga tacatgaaag 32040
aaggttggca tgttagagta acagtgaggg ataccatgtg tggcaggaga tgaagtcatt 32100
tgcagtctaa gggtctttag ggaccattgt gaggtgtttg gaccttgtcc tttatgggta 32160
ggaccttgct aagcaatgag aggaatacaa aaaaaaaaa aaaaaaaaa aaccacagtt 32220
gcccgtaaac acccttcagg aagaccatct caggtggcta gcacaaggtg tggcccatag 32280
caggcattaa ataattattg aatgagtgag ttatcaagta ctaaccatgt gattcaggga 32340
aataggtgct gcgggaactc agaagagaaa aatcactgcg agctagagac gtaagagtga 32400
aagggaggct tgagctgggc ccccaaagat ggagagctgt cagaaggtgt attggttttc 32460
```

```
tgtttgccac tctagtgaat taccacaagt ttaatggtgc aaagcaacac aaatttatta 32520
tcttagagtt atttaggtta gaagtcaggc acaggtctta gcaggctaaa tcaagatgtc 32580
tgcagggctg tatttctttc tggagtccct gggtaagaat ccatttcccg ccgggtgcag 32640
tggctgatgc ctgtaatccc agcactttgg gaggccaagg tgggcagatc acttgaggtc 32700
agcagttcaa gaccatcctg gccaacatgg tgaaaccccg tctctactaa aaatacaaaa 32760
attagctagg cgaggtggca catgcccgta atcccagcta ctcaggaggc tgaggcagca 32820
gaattgcagc cgggaggtgg aggttgcagt gagccaagat cgtgccattg cactccagcc 32880
tcggcaacag agcgagactc catctcaaaa aaaaaaaaaa aaaaaaaaaa agaatccttt 32940
tcctttcctt ttccacctcc tagaggctgc ccaacacacc ttgggtcatg gcccccttcc 33000
tccatcttca aagccagcag tagcaggttg agtcatcaca tcactctgac cttgcttctg 33060
tcatcacgtc tctgactccc tcttctgcct ccctcttcca cttttaagga tccttgtgat 33120
tatattgggc ccacccagat aatcccagat aatttcccta ttttgaagtc agctgatagc 33180
caccttaatt ctatctgcaa ccttaattct cctttgccat gtaacctaac gtattacacag 33240
agtctaggat taggacaagg acatcttcaa gggaccattc tgcctgccac aagaagatta 33300
ataacctgga ggtaaaaatg gtgtgagtca gtacagacgt aaacatgacg tgcttctatt 33360
agaaaacagt gatgggctgg gcacggtggc tcacacttgt aatcctaata ctttgggagg 33420
ctaagacagg gagattgctt gaaatgaaga gtttgagacc agcccagact ataatcctgg 33480
gcaacaaaat gagatccccg tctccacaaa acaaaattta aaattagggg ccaggttgtg 33540
gcagctcaca cgtataattc cagcactttg gtaggctgag gcaggcagat ggcttgaggc 33600
caggcattct agaccagcct gggcaacatg ccaaaacctc atctgtacaa aaaatacaaa 33660
aagtagccag gcatagtggt gtgtgcctgt agtaccagct actctggagg ctgcggcagg 33720
aggattgctt gatcccagga gtcagaggtt gcagtgagct atgatcgcac cactgcacac 33780
tacattttag cctgggcaac aacagagtaa gatcctgtct ctaaaaaaaa aaaaaaaagc 33840
aagcagtgat gtatgtttgc acgcacatac aaaagccatg aggagacctg cttagctaga 33900
aggaaggatt tatgctggag cagcaggaaa ggaaattgga gggttgataa gcaggttggt 33960
gggttgggat ttgttttgtt tgttttagga gacaaggtct cgctctattg cccaggctag 34020
agtacagtgg gagggtcata gtttactgta accttgaaat cctggcctca agtaatctta 34080
ctacctcagc ctcctaagta gctaggacta caggtatgca cccccatgcc aggctaattt 34140
ttttttttca atttttttgtg tagagacagg gtcttgccat gttgcccagg ctggtcttga 34200
actcctaggc tcaagctgtc ctcctgcctc agcctcccaa agtgttggga ttacagatat 34260
gaaccaccat gctggacctg ttttttgtttt tgaaggtgaa caattttaaa agtgtttttg 34320
ggccaggcac aattcaatca cttgaaccca ggaggcggag gttgcagtga gtcaagatca 34380
tgccactaca ctccagcctg ggcgacacag cgagactctg tctcaaaata aataaataaa 34440
aagtgttttt gtgtttgagt ggttaacata attaaaaata ttttcaaaaa gtacagaagg 34500
gactaaaagg gtcacctcca ctgcattagc ttttggtttt ttttggtttt ttttttttt 34560
gagagatgga gtttcgctct gtcgccaggc tggagtgcag tggcgcgatc ttggctcccc 34620
gcaacctttg actccctggt tcaagcgatt ctcctgcctc agcctcccaa gtagctgaga 34680
ttacaggcac gcaccacccc acccagctaa ttttttgtatt tttagtagag acaggtttc 34740
accatgtttg cgaggaaggt ctcaatctcc tgacccggtg atccacccgc ctcagcctcc 34800
cctgctggga ttacagatgt gagccaccgt gcccagtctg cattatcttt tttatctatt 34860
tatttatttc atttttattt atttacttac ttacttactt attttgagat ggagtcttgc 34920
tctgtcaccc aggctggagt gcagtggtgc aatcttggct cactgcaacc tctgcctccc 34980
gggttcaagt gattctcctg tctcagcctc ccaaggagct gagactacag gcatgcacca 35040
ccacgcctgg ctaattgttg tatttttagt agagacaggg tttttgccatg ttggctaggc 35100
tggtgttgaa ctcctgacct caagttatac acccatctca gccttccaaa gggctgcgat 35160
tacagctgtg aggtgccacg cccagcctat gtatttattt attttattt ttgtagaggt 35220
gaggtctcac tatgttgccc aaactgatat tgaactccta ggctcaagtg atcctccctc 35280
ctcggccttg gaaagtgcta ggattacagg catgagccac tgtgcctggc ccactgcatt 35340
attatataga ggcaatcagc gttaccttcc tgagagatac tgaggctgaa caaacatgtc 35400
ttgtatatgc atttgcatct ttttgttgtt ttaacacaag tggcagcatg ctatttagac 35460
atagccttct gtacctgctg tacctggctc ttctcactta ccaatatatc ttggaaatta 35520
tgccaccgta tgggcaattt gatttgactt tcattgattt ccttgttttt ttttttgttt 35580
gtttgtttgt ttttttgttt gtttttttgca gttgttaact aaaaagttac tccatgctgg 35640
tgtctggaga tacgttgttg aaaaatataa attgaatctc tgctcttgtg gagacaaata 35700
ctaatctata atcacagaaa taataatttc cttaaagtgg tagtagagct ccaaaggaaa 35760
aacccagggt gccctgtgga ggggtgatgg tgacacttat tctgattgtc aggaacaggg 35820
tgggggtgct ggttgacacc ctaaaccaat gcaggctctt gctcagaaaa aactgtcagc 35880
cctgagattt tgcagatact ttacaaagca cattcacctt tattacctga cctggttctc 35940
tgaataacct tgtcagaggc aaattttgct gttcccacta aattagttaa tacatgtaaa 36000
gtgcttacag cagtgccttg tagatggaaa atagtccaca aatattgtat tgttttacag 36060
atggggagac agagccagga gaagtcaaac attaagagac aaatagttta gggccaggcg 36120
```

```
cagtggctca tgcctgtaat cccagcactt tgggagacca gggcagacag atcacctgag 36180
gtcaggagtt cgagaccagc caggccaaca tggtgaaacc ctttctctac taaaaataaa 36240
aaaattagcc aggcatggtg gtacgtgcct gtaatcccag ctactcagga ggctgaggca 36300
ggagaatcac tttaacccag gaagaggagg ctgcagtgag ctgagatggc accactgcac 36360
tccagcctga gcagcagagc gagactctgt ctcaaaacaa cagcataaat aactgaaaat 36420
tagacccagc ctatttactg acagagctct taattgttgt acttagccac tgggctctaa 36480
tagtttttcta atgtcacttg tccatttttc cctcaacaaa cttgtggtaa gaggctaagt 36540
gtttaccatg ggccaggagt acaaagatga gctggagtac aaagatgagg aaattgtagg 36600
ctccacccct gaggacaata gcggactgag atagcttagg aggcggtgaa ttcatgagca 36660
gcacaggtct ttagcagaaa caagttgact gctggttgtg atgttataaa ggacattctt 36720
ggatcattta ttgcaaactg gctctgtgca gagctcactg tcttgggctt tttgagtgat 36780
acgtgggtgt cttgggggac tggaggggttg gtgggggaaa tgttttttagg aggtaattta 36840
gtacatgttt ctgcagccaa atacacatat tactgggtgg tcaggtgaga tgatattaat 36900
acttatgtga aaatgtagac ataaagttcc ttgataagca aagtaaagca agtgaactaa 36960
tttaaagaaa accatttaca gctggatgtt gctcacgcct ataatcccaa cactttggga 37020
ggtcgaggcg ggcggatcac ttaaagtcgg gagtttgaga ccagcctgcc cgacatggtg 37080
aaaccaactc tactaaaaat acataaatta gccaggcacg gtgatgggca tctataatcc 37140
cagctactca gggggctgag gcaggaggat cccttgaacc cgagaggcgg aggctgcagt 37200
gagctgagat cacgccactg cactccagcc tgggtgacag agtgagactc catctcaaaa 37260
aaattttttga aaataatggt gcagggccgg gcgtggtggc tcacgcctgt aatcccagca 37320
ctttgggagg cccaggtggg tggatcatga ggtcaggaga tcaagaccat cctggctaac 37380
acgagaaac cctgtctcta ctaaaaatac aaaaaattta tccaggcatg tagccggggc 37440
gcagtggctc acacctgtaa tcccagcaat ttgggaggcc gaggcgggcg gatcacttga 37500
ggtcaggagt tcaagaccag cctggccaac atggcgaaac cccatctcta ctaaaaatac 37560
aaagaatagc tgggtgtggt ggcgcacacc tgcaatccca gctacttggg aggctgaggc 37620
aggagaatcg cttgaacctg ggaggcagag gttgcagtga gccaagatca tgtcattgca 37680
ctccagccta ggcaacaaga gcaaaactct gtctcaaaaa aaaaaaaaa aaaattatcc 37740
aggcctggtg gcgggcgcct gtagtcccag ctactcagaa ggctgaggca ggagaatggc 37800
gtgaacccgg gaggcggagc ttgcagtgag ccaagatcgt gccactgtac tccagcctgg 37860
gtgacagagt gagactccat ttcaaaaaat aaaaagaaaa gaatagtgca aatattatat 37920
gggtggctat ggcagatgta aaggtgattg gcaattcttt ttctggaaaa gctggcccaa 37980
gggttaaaag gaagagctct ggagtgaaag agactgcctt tgcccttgac cttgggtaaa 38040
acttaaccctc ttcacatagt ttcatcctttt acaaaatgag aagggtgtgg caatgattaa 38100
gaaaaattca gggctgggcg tggtggctca tgcttgtaat cccagcactt tgagaggccg 38160
aggcgggcag atcacgaggt caggagattg agaccatcct agctaacacg gtgaaacccc 38220
atctctacta aaaatacaat tagctgggcg tggtggcagg cgcctgtaat cccagctact 38280
ccggagggtg aggcaggaga attgctggaa cctgggaggc agaggttgca gtgagccgag 38340
atcacgccat tgcacttcag cctggatgac agagtgagac tctgtctcaa aaaaaaaaaa 38400
aaaagaaaaa gaaaaaaaaa attcaggcta gggggcatgc ctgttatccc agcacttggg 38460
aggccaaagt gggaggattg cttgagccca ggagttcaag accagcctgg ccaacatggt 38520
gaaaccgtct ctactaaaaa tacacaaatt agtcgggtgt ggtggtgggc acctataatc 38580
ccagctactc aggggctga ggcaggagga tcatttgaac ccggcagagg ttgcagtgag 38640
ctgagatctc accactgcac tccagtcttg gtgacagagc gagactccat ctcaaaaaat 38700
aaaattgaaa ataatagtgc aaatattata tgggtggcta tggcagatgt aaaggtcatt 38760
gggaattctt tttctacaaa actggcctaa cggttaaaag gaagagctct ggagtaaaaa 38820
agacccccc ttgcccttga ccttgggcaa aacttaacct cttgacacag tttcatcctt 38880
tacaaaatga gaagggtgtg gggatgatta aggaaattca ggctaggggc agtggctcat 38940
gcctgtaatc ccagcacttg ggagaccaag gtgggaggat tgcttgagcc cagaagttca 39000
agaccggcct gggcaacaata gcgagacccc atttctacaa aaaataaaatt aactggtcgt 39060
ggtgacatgt tcttgtggtc ccagctactc aggaggctga agccggagga tcacttgagc 39120
ccaggagttt gaagctacag tgagccatgc ttgcaccact gcactcctac ctgagcaaca 39180
gagaccctgt ctcaaaaaaa gagagaaaga agaaaggaa aggaaaatgc tcgtagcacc 39240
taaaacagtg ctcagtaaat gtttgctgaa gctgtaacta tagtatgtag tagaaagtgg 39300
tagttatttg aaagagagtc aaagatacgt gctctgggaa ttaccactaa atgaccaaaa 39360
gttcacgtca aaaaataaaa atcagatcaa gttagaaatt ttttttttttt tttttttttg 39420
agacagaatc tcactcttgt cacccaggct ggagtgcagt gacgctatct ctgctcactg 39480
caacctccgc cttccgagtt caagcaattc tcgtgcctca gcctcctgag tagctgggat 39540
tacaggtgcc cgtcaccacg cccagctaat ttttgtagtt ttagtagaga cagggtttca 39600
ccatgttggg caggctggtc tcgaactcct gacctcaagt gatccaccca cctcagcctc 39660
ccaaagttct gggattacag gtgtgagcca ccgcacctgg ccagaaaaaa ttttattatg 39720
cacacaaaag aacagttgga gattagtcag atgctccagt cactgtagtg agggcagtgt 39780
```

76

```
taataaagcc taaggaagga ttttgacctt ttttgtgatt ggctgttata cattaacaat 39840
ctgtttacag ccagtagagc tgttcaaact gttttgtcta tagttgattc ctttaatttt 39900
actgaattat gctgacaagg atgtaaagct ttgtgttctg tttatgattg attagagcta 39960
catttcaggg aatcaggata tcttaaattc cggctatgtg gctgtgggca gttggccttg 40020
gagtatatct aaactgtggc ctccactttc attttttctg aaacattgct atcaactggg 40080
aagagtatgt gactttatgc ccagtttccc ctctcagatt tttatgacgg ttgttttttct 40140
ttttgttatg ccatttgagg gattgatgtt tcttaaacta tgaagtactt ggctgtctct 40200
ctccattgct gttcaggtta acagccacca tttgtaaaca ctttgttgga gctcattcct 40260
tctctgctag gaactttaca agaattgtct caatcctacc acacctttgg caggaccctt 40320
gttatcagag ttttcattat ccatgtatcc atagttacaa ggctatatag aaaagcaaaa 40380
gtcatcacac aagaatcttg ctaacaaact acttataaaa ttagtcacta cttaaccatc 40440
cctctgctta tccctgccag tcccattaac atgtttggta gtcaatttct ggctgatgaa 40500
gagatacatt aagcatcaag gtaatgcaaa tgtaaataaa actgactgta gactgaaatg 40560
gcacatctcc caaaacttgt aggactaggc gaaatccctg caagtgatga tagaaaacct 40620
tcagccttat accagttaac aaaggaagaa gggaaatcaa caaagatgat gagatggtaa 40680
aaacttgaaa agtagaggat ttgcctagga aaaattaagc ccttcggaaa cttagtaaag 40740
ctaaggaata ttttggcaaa accatctttt gtatgttgca aaagtgagac aggaaatgaa 40800
gtatagtgtt tgggaatttt tttttttttga gatagagtct tgctctcctg tccaggccgg 40860
agtgcagtgg tgcgaccttg gctcactgca gcctcagcct cctgagtagc tgggattaca 40920
ggcatgcgcc accacacccg gctaattttt gtattttttag tagagacagg gtttcaccat 40980
gttggccagg ctggtcttga actcctgacc tcaggtgatc cactcgcctc ggtctcccaa 41040
agtgttggga ttacaggcat gaaccactgc acctggccta gtgtttggga aaactatact 41100
aggaaaagaa tagttgcttt aagtcattct ttgattattc tgagaattgg catatagctg 41160
ccattataac ctacttttgc taaatataat aataataatc attatttta ttttttgaga 41220
cagggtcttg ttttgtcacc ccggctggag tgaagtggcg caatctcggc tcactgcaac 41280
ctccacctcc gggtgcaagc aattctcctg cctcagcctc ttgagtagct aggattacag 41340
gcacaagcca tcatgcccag ctaattttttg tatttttagt agagacaggg tttcaccatg 41400
ttggtcaggc tggtcttgaa ctcctgacct caggtgatcc acccgcctcg cctcccaaa 41460
gtgctgggat tacaggcgtc agccactgtg cccggccctg ctaaatataa tattaactttt 41520
ataatttttag tctcatttttc cacccagatc ttgtttatca ctatctgggt ggtagtgata 41580
aagttccacc cagatcttgt ttatcactat tccctatgaa atgtttctgg gtggccgggc 41640
gcagtggctc atgcctataa tcctagcaat ttgggaggcc aagacaggtg gattgcttga 41700
ggcccggagt tcaaaaccag cctggccaca tggtgaaacc ctgtcactac taaaaataca 41760
aaaaattagc caggcatgat ggtgggcgcc tgtaatccca gctactcggg aggctgaggc 41820
aggagaatca cttgaatctg ggaggcaggg gttgcagtga ggcgagatca tgccacggca 41880
ctccagactg ggcaataaga gcaaaactcc gtctcaaaag aaaaaaaaaa gaaatgtgtc 41940
tgggtatgtt tttggctgca attagctgaa aaccctgact caaaatggct tattgcagat 42000
acttagaagc ccagaggtgg gcctccaaag gtcattgtct cagtggcctg gactctgcat 42060
ttttccactc tgccatgttc aggtctcagc tttgtcctta ggaaggctcc ccatgtggca 42120
caaatgcagg agtcacatcc agaagaagaa gcctttcttg ccgggcgtgg tggctcacac 42180
ctgtaatccc agtgctttgg gaggctgagg tgggtggatc acgaggtcag gagttcaaga 42240
ccagcctggc caacatgatg aaacccccat ctctactaaa actacaaaaa ttaaccaggc 42300
gtggtggcgg gcacctgtaa tcccagctac tcgggaggct aagccaggag aatcgctgga 42360
acccaggagg cggaggttac agtgagtcga gatcttgcca ctgcactcca gactgggcaa 42420
cagggcaaaa ctccgtctca agaaaaaaaa aaaaaaaaag aaaaggccaa gcgtggtggc 42480
tgtaatccta gcactttggg aggcagatca cgaggtcagg agtttgagac 42540
cagcctgacc aacatggtaa aaccctgtct ctactaaaaa tacaaaaatt agccgggcac 42600
ggtagcatgc ctgtagtccc agctactcgg gaggctgagg caggagaatc gcttgaaccc 42660
gggaggcgga ggttgcagtg agccaagacc gtgccagtgc attccaacct gggtgacaga 42720
gggagactcc gtctcaaaaa aaaaaaagcc ttccttggtt tcctgccaat ttcctgtcat 42780
gtttctttgt cccgaattgg gccaatatcc atgcccattc ctaatacaat taccttaatt 42840
gacttagatt agccctgaag catgtagtga tgtgggggag gaatgacaac tgaagaaaat 42900
agaaagaag ggacaaaggt tgttgagttg gcaaccaaca attcctgtta tagcttttta 42960
aattaattca ctttaagtgg tactgattat tcatattgtt atttccatgt atagagagag 43020
aagaaattgg aggcttagag gaagtgaagt gacttgtcca aggtcacata gctaagtgga 43080
atttattttt tttttttta cttttctgag acaaagtctc actctgtcgc ccaggctgga 43140
gtgcagtggc gtgatcttga ctcactgcaa cctctgcctc ctgggttcaa gtgattcttc 43200
tgcctcagcc acccgagtag ctgagattac aggtgtgcac cagcatgccc ggctaatttt 43260
ttgtattttt agtagagatg gagtttctcc atgttggcca ggctggtcat gaactcttgg 43320
cctcaagtga tccacctacc ttggcctccc aaaatgctag gattacaggt gtgagccacg 43380
gcgcccagct actggaagtc atgatgcaag ctgttgtttg aatcatgaat tccaaactta 43440
```

```
atgagtgcta ggttgaagtt attttttttc tgtttccctt aatcttctat tgagatataa 43500
catgtattga agcacagaca tcttttgcaa gaattcattg agcactatag ttatattcat 43560
ctgtacttac tgtctccctg gtaaaggcat aaactccctt caagatgggg acatggtttt 43620
atactttcct gaatctcctt tagtgcttat atctaacagc acttaaccag gatctggagg 43680
gggtcaacca gtcttgcttc cttccaatct actctgtaga tgtttgtgtt tttctactgt 43740
aactatagag gtaaaggagc caatggtgtt tccagtgtct ggcacataat aggtgctcta 43800
tgaatgtcaa atgaatgact gaggcataaa aagttcttcc tatgacataa gtagtataat 43860
aggaagatca ctgggataga attttcttag aagacgtggc tcctagtcct agcactatta 43920
ctcttactga ctataacttt ggacaagtca tttgtttaat ttcaaacatt tactgaattc 43980
tgtgtaccaa atactgtaca agttgttcaa aaggctacag agtctctact ctcaaagtct 44040
agtcagggga gagattacac aggagtgaaa ccccatctct actaaaaaaa aaaaaaagaa 44100
agaaaaaaat agccaggcat ggtggcaggc acctgtaatc ccagctcttg ggaggctgag 44160
gcagaagaat tgcttgaacc caggaggcag aggttgcagt gagtcaagat cacactactg 44220
cactccagcc tgggcaacag aacgaatatc tgtctcaaag aaaaaaaaaa aaagaaaaaa 44280
aaagtatgtt tagagatcct taaggaagtt ttgaacctat ccaatatgtt gggagtcaag 44340
atgaggaggg taaaagtagg aattcagaga aaggataaat attttgaagg aaggcagcat 44400
aatggttaac tagtcagact gcagacaaac aagcagtaca aatcccatgt tcccaggtct 44460
tagctggagg attaaatccc agattctcat ccttgagaac ctctttaagc ttgttttccc 44520
atctgtaaaa tgtagatgat aatagaatcc ttttcctact gtaaaatgat gcacattggg 44580
ggcttcatgt agccagatat ataataaatc ctcaatacat gtagcagtgg taggggagaa 44640
ctaaaagact tgttaacata ttggatgtag gtgagaaaga agaatcaaaa agaatatcca 44700
ggttcccgcc ctgggagggg cagacataaa tggagccagg aatggtacaa ggagctttgt 44760
ggtgggcact cactagtacc tttctttgga atagctcaac aaatgttcac taagtacaca 44820
taaagtcaat ataacttgat gagctagagt taggctaaga tgttgagtta gcagaagagt 44880
agtacccaac taagggcttg aggaaggctt cctagaaaag ataatgggtg cacgtagtcc 44940
tgaaggatga gcaaggcttg cgaggaggga aggtaggaag ggcattccag acaaagggac 45000
aaacatgcac aaaggtgaga cagagcatgg tgaacacaca aagttgtagg cattttgtct 45060
ttctaggaca caaaaaacaa ggtgatgaaa acaaggctgg agagacaagc ggagaccaca 45120
agtggtcacc cctcactggc ctcgctgtac tactggactg ctccagccct tcctggccca 45180
gagctagaga tggcaccacc cccgcactgt gcacacaata ggtacagaca ctctcagccc 45240
caaacccctc cagcctgtta ctgtgagact cacacatcct gttttcccaa gcttgcccca 45300
cagggtgagc aaactggacc agctggatta gagtatttgg aaaagtgcag gtggagtttc 45360
taggctatgc cacgtcaggc caggggtga gatttttttc ccttccctg tctttgggc 45420
tggggcactc cctgaggagg gaggggtgtg acccatccca cccattggtg gtccatgatc 45480
cattcatcca gtacatcatc cataagcatc tgctgagccg ggcgcagttg ctcacgcctg 45540
taatcccagc actttgggag gccgaggtgg gcggatcatc tgaggtcagg agttcaagac 45600
cagcctggcc aacatggtga aaccccgtct ctactaaaaa tacaaaattt gccgggcatg 45660
gtggcgcatg cctgtaatcc cagctactcg ggaggctgac acaggagaat cgcttgaact 45720
caggaggcag aggttgcagt gagtcgagat cgagccatcg cactccagcc tgggcaacaa 45780
gagtgaaacg ccatctcaaa aaaaaaagca tctgctgaag gcacagtatt gtgttagagg 45840
cttggactac cctgaggaat aatagtcctg acacttgagg acatccccat ccaattggaa 45900
aggcactgga taaacatcta agaaaatgtc acaaggcata aaagctgtaa taataatagc 45960
taacttgtat ttagggtaaa caaaaggctg aatcaggctt tggactaaat attttgcctg 46020
tggctcattt aatcttaata acaaccataa gattatctca ttttatgatg aggaaactgt 46080
atacagagag gtgattgact tgcctaaggt tgaacagctt atgagtagta gagccagtat 46140
tcaaatccag tcagcctcca gtgtcccctc tctttagtca ttagatatag tgctacccag 46200
agaatctgct aagccttata gataaatgct atgaattcag aggcaggagc aattactgtg 46260
gcttggggc atccacaaag actttctaag gtggtgacac ctgatttggg ccttgaaact 46320
ggttgaatag agataagaaa agaacagata atcaatttaa ctgccgttgt gttttgaatc 46380
atcactttaa gcctagaatg acaaagctgg aaaagaccct aaatatcatc tagcccagtg 46440
gttatcaaat tttcttagga tgtggacatt tttctttaaa tgaaacatga gtagaagcca 46500
gatgcagtgg ctcatgcctg taatcccaac tacttgggag gctaaggtga gaggattgct 46560
caagcccaga agttggacac caacctgggc aacggtgaga ccttgtctca aaaaagaaag 46620
aaagaggccg agggcggtgg ctcacgcctg taatctcagc actttgggag gctgacgcgg 46680
gtggatcact tgaggtcagg ggttcgagac cagcctggcc gacatggtga aaccctgact 46740
ctactgaaaa tacaaaaatt agtcaggtgc agtgctgcat gcctgtcatc ccagctactc 46800
gagaggctga ggcaggagaa tcgcttgaac cccagaggtg gaggttgcag tgagctgaga 46860
ttacaccact acactccagc ctgggtgaca gagtgagact ttaatttcaa aaagaaagat 46920
gagcagtaat cttgtctctt aaaaggagg accaaacatt ccctagcccc aaaacattcc 46980
ctgaaaagtt cagttgagaa ccactgatct agtccaatgt cctgggatcc tcgctttat 47040
ctttgctatc tggagaagga agagacagcg gtagttccca aaagacacaa acaatgggga 47100
```

```
cattttaaac gggagtaacc agctaagcac tctgctgctg ctgcttgtct atttgccctc 47160
ttgtcctgcc tcagggtgaa ttgttggcag ctacaaatgg caaccaagag agaatggagt 47220
tggggcttag aagtgcggta gaggaatatg aaggggggctg gagttggaga ggctcttaaa 47280
gaaagagctg actatattgg gactggagag ttaatgtaaa tctcttcttg gttcatgggg 47340
attttgttgt tattgttttt ttccccatga cacaactctc aggagatcct gagaacacgt 47400
gccctgattt ggggggggtt ttaattttaa cttttttttt ttttttttt ttttgacaga 47460
gtctcactct gtcacccagg ctggagtgcg gtggcgccat cttggctcac tgcaagcaag 47520
ctccgcctcc cgggttcacg ccattctcct gcctcagcct cccaagtagc tgggactaca 47580
ggcgcctgcc accacaccca gctaattttt tgtatttta gtagagacgg ggtttcacta 47640
tgttagccag aatggtctcg atctcctgat ctcgtgattc acccgcctcg gcctcccaaa 47700
gtggtgggat tacaggcgtg agccactgta cctggccaaa attttttttt aattagagac 47760
agtctcttgc tgtgttgccc aggctgatct caagcagtcc tcccaccttg gcctcccaaa 47820
gtgctgggat tacaggcgta agctatagca cccagccttc cttctttcct taattctatt 47880
ttttttttg tttgtttgtt tatttgtttg cttttgagat ggggtcttgc actgttgcct 47940
gggctggagt acaatagcgt gatctcggct ccctgcaacc tctgcctccc aggttcaagg 48000
gattctcctg cctcagcctc ccgagtagct gggattacag gtgcctgcca ccatgcctgg 48060
ctaattttt gtatttttaa cagagacagg gtttcactat gttggccagg ctagtctcaa 48120
actcctgacc ttgtgatctg ccctccttgg cctcccaaag tgcggggatt acaggcatga 48180
gccaccatgc ccagccttcc ttaattctat taatatatga atcctttct tttttttaaa 48240
aaaaagagat agactcttga tctgttgctt aggctggagt gcagtggcac aaatcagagc 48300
taactgcagc ctcaaactcc tgagttcaag caatcctcca gcctcagcct cccgagtagt 48360
tgggaccaca gttgggaacc actacacttg gccctactac gggttttttcc tgtttgtttg 48420
ttttttgttt ttttgttttt ttgttttttt gttttgagac ggaagtttgc tctcgttgcc 48480
caggctggag tgcaatggcg cgatctcagc tcactgcagc ctccgcctcc cgggttcaag 48540
cgattctcct gcctcagcct cccgagtagc tgggactaca ggcatgcact accatgcccg 48600
gctaattttg tattttagt agagtcgggg tttctccatg ttggtagtca ggctggtctt 48660
caactcctga cctctggtga tccgcccatc tcggtctccc aaagtgctgg gattacaggt 48720
gtgagccacc gcgcccagct gtttgttttt ttgagatagg gtctcactct gttgcccagg 48780
ctggagtgca gtggcatgaa catggcttac tgcagcctta acttcccagg ctcaagcgat 48840
cctcccttct ctgcctcctg aatagctggg accacaggaa tacaccacca cacctggctg 48900
attttttaaat ttttgtaga gccagggtct ctccatgttg cccaggctgg tctcagactc 48960
ctgggctcaa gtgatcctcc caccctcagcc tcccaaagtg ctggggttat aggcatgagc 49020
cactgtaccc agccccctcc agggtcttat ctttataagg ggtgggggggt ggtcagcacc 49080
tttctcattg ttacctctac cttccctagg tatgtgcagg tgaaatttgt ctgcattcgg 49140
acccaatcaa acaggaagag aacgcgggag gcagacatgt gcccagcgta cttgctccta 49200
aggtacaacg agagactaga tagactattt atcagtgaac taaacacaca gcacatacat 49260
ggtgactcta aagtggctag tcctggagga gacaccactg gcaaatctca aaagacaatg 49320
tgcctgcaga gactccagcc tgtgcagccc acaaccaaaa aagaccttga cactgccgag 49380
aagtccctgg ttgagccatc gttttgccta gataaggtac aagtgtcctc aaagccagag 49440
caggaaggca tcactccttc tgacctggcc aagatagcaa aagtgatgaa gaactttctt 49500
aaggtagatg agggttccat ggcttccttc agtgtgggtg acagccagca cctggaccgg 49560
ctcagcttcc agagcagtaa gatgaccgac ctgttcatcc gcttcccaga gaatctcttg 49620
ctacaccggg tggagaacac ccagggccac atcctctatg ctttcttggt ggagaacaag 49680
gaacgagaaa gtcgagtggt gcactttgct gtgctcaagg cggagacagt cacctctgtg 49740
gccaagatgc tgagcatctt cacagagttc aactccgatt ggcccaaggt caaggtggtc 49800
tttgtggacc cttcattcca ttaccgggct atcctgcagg agatctttcc tgctgcccgc 49860
atcctccttt ccatcctacca cacaacccga ctcttggaga agaagttgca tcgtagttca 49920
gcaaatccat cctttaaaag gctcatgaag gaagccctgc gggaggccgt gtttgtcact 49980
tctgaagcca gcctgaaaaa tctctgccag atgtcccagg ccgtactgga tgaggatctc 50040
ttcaacttcc tgcaggccca ctggttcacc tgtgaactgc tgtggtacat gcatgttagg 50100
aagggcctgc ttgcgtgtaa cacctacatg gacagcctag acattgtcac cagcaaggtg 50160
tcaagcctct ttcgggaaca gcagtcgctg ctggactgca tcctctgctt tgtggattac 50220
atagacttct ttaataccaa aggcttgaag aacttgccca cacctcctcc caaattaaag 50280
agagctcggc cggcaagcat gccactgaag tccaagaagg cttttggaat ctgtggagag 50340
agccttacca gcctccctgc agaagagacc aagccagacg cacagcaggt acaggtacag 50400
cagcagtcac aagtgccgcc ctcgcaggtt ggcatgctgg acaccttgca ccagagtggc 50460
tctgaactag cctacaagct gtgccacaat gagtgggagg tggtacagaa ctccacccac 50520
ctggtggaca tggctggctc ttcagtggac gttcagctgc tagaggactc tcaccaggtt 50580
agcaaagatg gctgtagctg cagctgttcc tttcaacaat ggtaccacct gccatgccga 50640
cacattttgg ctctgctgca caccagccag cagccggttg gtgaagccat ggtgtgccgc 50700
cggtggcaga agaagtacca gtacctcctt gggcccaatg gggagctcca ggatcgtggt 50760
```

```
atggtcccaa acacaggcca gcctgagaag caaggacgga acgacatgat tcaggaccta 50820
agcagggagt tagcaaacct gctcatgcag accgaggggc cagagctgga ggaacgctac 50880
tccaccctgc gcaagattgt ggatatctgg gctggcccct cccagccatc tgagctcttt 50940
cagcagccag gagactttaa ggacgtgggc cgcctccctt tcctctgggg aaagcaagaa 51000
gaaggggagg gattccctcc tgctacagct gtgatgcatt attgaagcac tttagctgaa 51060
gcattggacc acaaacactt ctccttggaa gtgtgagagt ttaaagtggg caggacatac 51120
tagggtttag cattttagcc aatgtcttcc taggtggggc taggaatatt gttacagtag 51180
agaggaaggg aactccactg tgtgacagtc ctttcaatct gccccttttc agccctactt 51240
ttggcattcc ttgggagcct cagttgttgt tcaaggccaa agttatctcc gtgctgcaag 51300
gtcaccctct tcctccccca gcccctgaga tcagatctta tttgctctgc aaagatgaat 51360
ccctgcctca ggttagggtg agacaaaatc ggtctggtaa aagggcctgt tttcagggac 51420
aaagggaatg aggatgatct ttggctgttg ctgctcttta tgaagaatct tatttgtaac 51480
tttttattca tattaaagtt gttttttaata aaattaaaca agggaaatgt gttctgcttg 51540
atcagggaag gaagaggaat tgcatagcaa taggactcga cttttacagtt aggaagtggc 51600
tgctctaggt ggatttatta attttaaaga aaattgaggc caggcgcagt ggctcacact 51660
cataatccca gcactttggg atgtcgaggc gggtggatgg atcatctgag gtcaggagtt 51720
cgagaccagc ctggccaaca tggcgaaacc ctgttctact aaaaatacaa acattagcca 51780
ggcgtggtgg cgcacctgta atcccagctt cttgggaggc tgaggcagga gaatcgcttg 51840
aacccaggag gcggaggttg cagtgagcct agatcgtgcc accgcactcc agcctgggtg 51900
acagagtgag actctatctc aagcaaaaaa caacaacaaa aaaaaagaa aagaaaatta 51960
agtattagca acctaatggg gttgtggagc caaatagaac ctgatgcctc acattcaagg 52020
atttggcaat ctgcgtctta atttgcctcc ttcctacaac taagccttca aggttgattt 52080
caggtttcct tatattctag cgggaagagg ccaaatagac tggagggtgt gggggaaaaa 52140
cctgaatctt agacttgact gccagcaact tgctggggaa ctgtgggcaa tttctttgac 52200
ctcagtttcc tctgtaaaaa ttagcatgtt ggcctgttct aatcccagat ttcccctcta 52260
ggtttacata agcacctttt tgttttttgt tttgagatgg agtttcgctc ttgttgcttg 52320
ttgcccaggc tagagtgcaa tggcagaatc tcggctcact gcaacctctg cctactgggt 52380
tcaagcgatt ctgcctcagc ctcttgagta gctgggatta taagcatgtg ccaccacgcc 52440
tgcctaattt tttgtattta gagatggggt ttcaccatgt tggtcgggct ggtcttgaac 52500
tcccgatctc aggcaatcca cctgcctcag cctctcaaag tgctgggatt aaagggatga 52560
cctactgcac ccagcccaat aacattttcg atgcgtaagt accaacactg atttgatgtt 52620
gctagttggt aatcttaatc ctccaaggcc tggtaaacac ccagttttct aagtctgcca 52680
tcttcaaggg aactgaggac aagagaccag ttagtaggcc cttgcactac tgtagtagga 52740
ccctaaataa gtcatggcat cattctgtag aatactggag ggggttgggc tagagaatgc 52800
caagttttgg cttgtttaag gggatctgga tttcctcagc tctaaaagtt gggctcctga 52860
tccccgaagg aggagtagaa tttgagacct ggaactcagt ttccccataa ggtagaatat 52920
gcgttatgac tatatatgca ctgtttccta aattccaggg gctttagagt ttcacacaca 52980
cacacacaac aaaacaaaac ccgcggtggc tcacgcctgt aatcccagca ctttgggagg 53040
ctgaggtggg cgaatcacga ggccaggagt tcgagaccag cctggccaac agggtgaaac 53100
cccgtctcta ctaaaaatac aaaaaattaa ctgggcgtgg tggcgggtgc ctgtaatccc 53160
agctactcag gaggctgagg caggagaatc atcgcttgaa cctgggaggc ggaggttgct 53220
gtgagtcgag atcttgccac tgcactccat cccaggcgac agtgcgagac tccatctcaa 53280
aaaaagaaaa agaaaaaata tatataaac tgctatttat tttccttttc attttctgct 53340
tttgagggag tttccatagt aacgtgtcct tccagtcgcc tagcctgaag ggaagccccg 53400
gagctccagc ttcaaggctc agctctccca gatgcaagta tctttacctc cagccagctc 53460
cttgtaaccc tggcaacacg gcccgcccgc gaatcgtcac gctacgattg gtccgtggtg 53520
ctaaagcctg aaagcgaatt cctcagacat tggtccgagt cactgcgatg ctgacgctgt 53580
ggttggtgag tttggatgtc agtcagagtc ggaggcaggg tcaaataggg agaaatggcg 53640
acggagcctg gctgtgggtg agtgcttcct gaaggggtga aagtgtgaga cagcggatca 53700
ccgcagttag ccgtcacaca gctcccaaag ggatgggagg gaggttttct tctcatccgg 53760
ctccagctgg actctgggaa tgtcagacat ccacatctcc cacccaggtt agaggtgaga 53820
ggtcaaaggc cgtattccct ctgttggttt ttggacccca ggtactgtgg acagcagtca 53880
ggatcccgaa ccaaagactc aactttcagc tacttacaga gtaatggtgg gcaagtcact 53940
tagcttcttt gagccttagt ttatcatctg taaaatgagg acagtaactc ggtctggggc 54000
caaatagagg aaacaatgga atagagtatt gctgctaaaa gagggatata gtagaggcag 54060
gagaagctat gcacatttgt tagccatatt ttatggtgga agggattgag gctcagagag 54120
ggtcattgac ttgcccaaga taacacagca agtttggagc aattgcagtt ctcttataca 54180
taccaggacc aaaggaaaga atggatgcca atcagtcatt tataaatata aaatcgtatt 54240
tttatttat tttattttt gagacagagt ttcactctgt cacccagagc tggagtgcag 54300
tggcgcaatc tcggctcact gcaacctcag cctcctgggt tcaagcaggt ctcctgcctc 54360
agcctcccga gtagctgaga ctacaggcat gggccaccat acccggctaa ttcttttgt 54420
```

```
attttttagta gagacggggtt ttcaccatgt tggccaggct ggtctcgaac tcccaacctc 54480
aagttatctg cccaccttgg cctcccaaag tactgggatt acaggtgtga gccactgcac 54540
ctggctagaa tgctattttt ttaaaaggcc atatgcagct ctggccatac ctatttaaat 54600
cccctggaac catatctttc catagctaac ttcttatcat ttagatttca gctccaatgt 54660
catccttctc ccctgagagg ccttccatta ccactttaac taaagtatcc ctcccttccc 54720
cagcttactc tctgacatgt tactcaggtt tatggtcttt gtaagcttca ttattggata 54780
tatatttgct tatttgttta catgtttatt gtgtatcttc ccctagaaca gtgctgacat 54840
atagtaagtg ttcaacaaat attgtgtgga tgaataattg aagagccagg tccctgctgt 54900
ctccttaaac ctctgttact ctccataggc ccatctttgg aaaaaagatc tgggaatgat 54960
tgtctagcct ccagcctcaa cttacttgat gcttgagaga ctcaaagccc cgtggtcagc 55020
tgccctgcaa agaaagtatt ttgaccttgg catttggaca gctcccatct ctcccatggc 55080
cctgacaatg ctgaatgggc tcctgattaa ggactcaagc ccacctatgc tgctgcacca 55140
ggttaacaag actgcccagt tagatacctt caactaccag agctgcttta tgcaaagtgt 55200
ctttgaccat ttccctgaga tcttatttat ccaccggacc tataacccaa ggggtaaggt 55260
cttatatacc ttcctggtgg atggacctcg ggtgcagctg gagggtcatc ttgcccgagc 55320
agtctacttt gccatccctg ccaaggagga cactgaaggc ctggcccaga tgttccaagt 55380
attcaagaag tttaatccag catgggagag agtctgtacc atcctggtgg atcctcattt 55440
ccttccactg cctatcctag ctatggagtt ccccacagct gaggtccttc tctcagcctt 55500
ccacatttgt aagttcctcc aggccaagtt ctatcagctg tcccttgaac ggcccgtgga 55560
aaggctgctc ctgacctccc tgcagagcac aatgtgctca gccacagcag gcaacctgag 55620
aaagttgtat acactcctga gcaactgcat ccctccagcc aagctgcccg agcttcactc 55680
acactggctg ctcaacgacc gcatctggct ggctcaccgc tggagaagcc gagctgagag 55740
cagccactac ttccagagcc tcgaggtcac cacccacatc ctcagccagt tctttggtac 55800
caccccatct gagaaacaag gtatggcttc tctgttccgt tacatgcagc agaactctgc 55860
agacaaggca aacttcaacc agggcctgtg tgcccagaac aatcatgctc cctcagacac 55920
catccccgaa agccccaaac tggagcagct ggtagaatcc cacatccagc actccctcaa 55980
tgccatctgc acaggccag cagcccaact gtgcctgggc gagcttgctg tggtccagaa 56040
atccacacac ctcattggct ctggctcaga aaagatgaac atacagatcc tggaagatac 56100
ccataaggtg cagccccagc cccctgccag ctgcagctgc tactttaacc aggccttcca 56160
cctgccctgc cgccacatcc tagccatgct cagtgcccgc cgccaggtgc tccagcccga 56220
catgctgccg gctcagtgga cggcaggctg tgctaccagt ctagacagca tcctgggcag 56280
caagtggagt gagaccctgg ataagcacct ggcagtgact cacctcaccg aggaggtggg 56340
tcagctgttg cagcactgca ccaaggagga gtttgagcgg aggtatagca ccctgcggga 56400
actggccgac agctggattg ggccttatga gcaggtccaa ctctgattat tctcgatgcc 56460
cagagatgct catgcacctg tgcacactca catccaccca tacacacaca ˙cacacacaca 56520
cacacacaca cacacacact cccttacact gttgtacttc cgtgggccct ccttccagaa 56580
caaggacaac aaggacaagg ttgaagggtc ttctcatcta ccatggcctg ctacctagca 56640
tgtgtctagc tcaatgagac aggagtcagc aaatcttaat ctgtttagtt tactcaggtg 56700
gccacataca gtctctgttg tatattcttg gttttgtttt aatatttttt ttctttttttt 56760
tttttttttt tttttgaga aggagtctgt ctccgtcacc caggctggag tgcagtggcg 56820
caatctctgc tcactgcaag ctccacctcc tgggttcaca ccattctcct gcctcagcct 56880
cccgagtatc tgggactaca ggcgcccgcc acaatgccgg gctaattttt tgtattttta 56940
gtagagacgg ggtttcaccg tgttagccag gatggtctcg atctcctgac ttcgtgatct 57000
gcccgcctcg gcctcccaaa gtgctgggat tacaggcgtg agccatcgca cccggcctgt 57060
tttaacattt tcataaggta aaaacctttc ttagctcaaa ggtctttaaa aaagcaggca 57120
atccagctgg gcatggtggc tcacgcctgt aatcccagca tttctgggagg ctgaggtgga 57180
cagatgactt gaggtcagga gttcaagacc agcctggcca acatagtgaa accctgtctc 57240
tactaaaaat acacaaatta gccaggtgtg gtggcgagga gaggttgcag taggccaaga 57300
gggaggctga ggcaggagaa tcgcttgaac ctgggaggca gaggttgcag taggccaaga 57360
tcctgctgcc actgcactcc agcctgggac ggtgagactc catctaaaaa aaataaaata 57420
aatggcaacc cctggttgcccc gataagagat aaaacatcag gtggtgaggt tgaggtttgg 57480
ggcttggtag cagttgcccc agtcatgaga tgactcactt aacccgtctc ctttaagtga 57540
gctgggctgg gaggcttcct acaggggaag aggcccctct ggggagctga ctcagccagg 57600
ctccctgaac ttttttcctt gtcccatcct ggggtcaata aaactgaatg ttgcatattc 57660
tagcacttgt ctagtttttt ttttgttcca tagaaggcag tttagggtat atcatggaga 57720
gaatagactt tagagtgtta tacaacatgt gaatcctggt tggttccttc cctgcttgat 57780
ttttgtgcct ggttctgcct tttactagct atgagactta ttaggataag ttacccctct 57840
aaacctcaac ctgattatct gtaaaaatgg ggatctccac agggtatgtt cacagagcag 57900
gcatacctag tgggtgctca attaagtatt aattttcctt ccttgcctat ggtcctatga 57960
cctgccttca acatgctggg aaatttaagg caagaggaga attcaaatac ctaggactta 58020
atataagaaa ttctggccag gcatggtggc tcacacctgt aatcccagca ctttgggagg 58080
```

```
ccgaggcagg cggatcacct gaggtcggga gtttgagacc agcctgacca acatggtgaa 58140
accgtgtctc tactaaaaat acaaaaatta gccgggcgta gtggcaggca cctgtaatcc 58200
cagctattcg ggaagctgag gcaggagaat cacttgaacc tgggagacgg aggttgcagt 58260
gagccaagat catgccattg cactccagcc taggtgacag agcaagactc tgtctaaaag 58320
ataaaaatta aaaaaaaaaa attctgggta ggccaggtac ggcgtctcac gcctctaatc 58380
ccaacacctt gggaggccaa aacaggcaga ttggagcagc ctgggcaaca tggcaaaacc 58440
ccttctgtac aaaaaataca aaaattagct ggatgtagca cgtgcctgta gtcccagcta 58500
ctcaggaagg ctgaggtagg aagatcactt gagcccagga ggttgaggct gcagtgagct 58560
gtgattgtgc cactgcactc cagcattggt gacacagtga gaccctatct caaaaaaaaa 58620
aaaaattctg atcaagtctt caaaacaaca taaaagcagc cttaactctc caagcagggg 58680
cccctacctc agataaatttc cattgtatct acctgacaaa acctatctcc tgtcttagtg 58740
gtatctggag aaactttagg gtctggaagt ccctgatgaa ggactggaat ttgtcagaat 58800
ggctcaacca ccagctctat ccccatccct gccataggcc ctcctcccaa ccctgtctgc 58860
ccaagaacca tacggagaaa ccaccctaca tatctggtgc tatttcatcc atctacaagc 58920
aggagccagg aggctggccc ctttttagatc tcactagggg catcttccca gaggctgtgt 58980
gggcatgtgc ctgctcccac cgcgcccccct ccacagcacc ctctggctcc ggatgggcca 59040
tcatgaaagc ttgagcggcc cagatcaggt cctcttcccg aactcctggg acgggcacgg 59100
tggggatgcc agcgatcatc atggcgaggg tgaggatgca gatatcaggc tgggagctgg 59160
cctccttccc cactgcctca gagggtaccg gtagaacccg tggtgacagc ccacacagca 59220
tcaggggcct aggcctgctg gggccaccca ggtcaggggc tctgcttctg gagtagccat 59280
tgtcccagcc caagctctcc agctgcctca catgcgggaa tttgtggcag tttcggctgt 59340
attccttccg tagtgtctcc cagctagtcc ccccagggca gccctggct tgtggcattg 59400
ccagggctgg gccccaggcc tgggcagcag gtgccacctg ctcagctttc tggctcagtg 59460
ggcctgttcc accagaggcc accaccactg gctctacagg actacagagg ccaagggaca 59520
agcctggaga agcagcccca cctgcagaga caggaatgaa atggaacgtt attctcagtt 59580
ctttgaggag gggccctga ggggcagggc atgggagcag agcttggggg cgtaactaag 59640
accagcccca gcggactgtc tagaggttgg gaactaggtg ttactcatat ccacactccc 59700
agtccccaac acggagtagg tgatggagaa gcgtttgttg aattaatgaa tagtgagcaa 59760
gcgggtagtt attgattggc aaggatgttt ggaatggctt ttcttctaaa agaattgatt 59820
ctagggccag cccccaaatg cccagcagaa ccgccacctc cccagagcca gaaagcaact 59880
tctcagggga agctgccgca ctccctccaa ttgcaggtgc ccccgctca ccttggccgg 59940
aaggcagagg acctggatga gtttgtggag tcctgaagta ggacatggct tccccaaagc 60000
cccggtttgt gaggaatag tgatctgccg cctgtcctcc cttcttcacc cttctagaat 60060
gtcacctcat agaccctccc cttcacactt ggaatccact ttacagcgtt gacctattca 60120
ttctagaacc tggacatgac aataggatga ggttaaaaga gcaccagacc aggagctggg 60180
tgttctaggt tcttgcccta accttgaacg agtcacccag atagtttttgt tccttgatat 60240
ccttatctgt aaagtgtgtc tgatgactgc ccactacctc attaggagtt ttgaggatga 60300
aatgagatca tttgtatgga agcagatgac cagagatgga aacacaggag ccaagtgctt 60360
cgtgccttgt agagtaagac ttcgggtcag acccagtatt ggtattttc tttttctttt 60420
tttgagacag agtctcactt tgtcgccatg actggaaggc tggagtgcag gagcaagacc 60480
tcagctcact gcaacctctg cctcctgggt tcatgcaatt ctcctgcctc agcctcccga 60540
gtagctggga ctacaggaac ctgccaccac acctggctaa cttttgtatt tttagtagag 60600
acagggtttc accatgttgg ccaggctggt ctcaaactcc tgacctcaag tgatctgccc 60660
acctcggcct cccaaagtgc tgggattaca ggccaggtat tggtatttt caaaattcct 60720
caagtgatta taatatatga caaagttgga acctttttc tagggacata cttctcaacc 60780
ctggctgtac atgagaatct cttgagaagc ttttacaaaa cacaatgtct aggcctaatt 60840
tcccaacaaa tcaaatacga atccctaggg atgggatgtg ggacaccagc actctttaca 60900
tatcctaaga tgactctaac aagcagccag cctagggacc cctgctcttt tgctccgacc 60960
tgctgacctg cagtgattct aaacgaagtg actctcatag gctgtagggg caaggagacc 61020
ttccagtgat caagatgtca gcatcggctg tttatttctg gtcttggctg gcagcaatgt 61080
ggccaacttc ggaccagcca gccacaggtc tggggctcca ggatgcagct gtgctctggt 61140
gcactgtggg tcttcactca tacttgcaga aatccttaag ttctttgggc aggtggagcc 61200
catcaatggc cagccggtgc accatgctcc tttgtatcac taggcggcac agagtctgca 61260
gggatggcac tgtgggaaga agactgtgaa aggcaaactg aactggaggg tgggtctgag 61320
gccaagatcc agaaggtcta ggtcatggtc cccacttttgt cattaaatgt gggcaagtcc 61380
ttactgctct ctgggcccag cctgcttcat ggggctgaga gaagcacctc ttcctgagag 61440
ctgccacaaa gctgcagccc tgtttatatc ataacactta gcacaatccc ttccccattc 61500
acttagcagc ttctgggggc aggggtagtg tctgatttgc ctgtgcaact gaagcctcca 61560
gcacaggcct ggcacaaaga gggttctggt gcattgagtt catgaaatgt gatgagaggt 61620
ataactgcaa tgcttaccag ggctataatg aatcatactc agcattaaga agctctcagt 61680
ctggggtttg ttatgcctcg aagccaatag ccaatatgcc caagtctatg agcatgtttc 61740
```

```
tttcttttct ttctttttttt ttttttattt aaagagagag ggtcttgctc tgtcacccag 61800
gctgaagtgc agtgctcagt gaactgcagc cttcaattct tgggctcaag cgatcctcct 61860
gccttagcct cccaaatagc tgggactaca ggcatgcacc accatgccca gataattatt 61920
taatttttg tacagatggg gtctcacttt gttgcccagg cttgagctag ctagcttgct 61980
tgcttgcttg ctttctctct cttcctctct ctctctcttt cttttttttt tcagagtctt 62040
gctctgttgc ctaggctgga gtgcactggt gagatctcgg ctcattgcaa cctccacctc 62100
tcgggttcaa gtgactctcc tgcctcagcc ttctgaatag ctgggattat tggcacatgc 62160
caccacaccc agctactttt tgtatttta gtagagacag gctttcacca tgttggccag 62220
gctggtctcg aactcctggc ctcaagtgat ctgcctgcct cccctccca aagtgctggg 62280
attacaggtg tgagccactg tgcccggcca agcatgtttc taagaaaagg gcaaacaatt 62340
ctcaaagagg cccctaatat ctaaaattgg tttagaatcc ctgccctagg tgaatacagg 62400
aaacactatc aaaactaaaa gggaacttgt agggcatctt aatcaatcaa ccaagatagg 62460
taccaaggcc caaaaccatg tagaggcttg tgcaagatca caagcagagg tgcaatttga 62520
agctagattc tcccactctt aaactagtgc cggacagacg aaggcctagc acatgggcta 62580
cggagcccta gtagattcca gtccccacac tgagccagga ggggtcgctg cccagggata 62640
cctacagcca tactcgagct ggacaaggcg cacgctcttt gtggaagcaa acacgtccac 62700
caccgcgtag aggggctgcg cagctggcag tccccgggcg ctcgggccca tgtcctcgcc 62760
gttgatgatg atgtgcatgt cggccgtgcc atcggggcgc gggcaaaaga ggacacccag 62820
gcggctacgg cgcgcggtcg gaggcagcac gttcagctca tagagctggt ccaagagatg 62880
gctgtagagc cctggccggc tgcggcccac caggcggtcc cggggaatgc gaaactgctc 62940
aatgcgcaga tatggttcca cgaggagggt tggaggtcgg ctgggggccg ctgcctccgc 63000
ctccgggcgg ccctcccggg gcacgcggtt gtggtggcgc gtgatggcga agacccaggt 63060
gtggcccagg ttgaccagat cgggcagaga aaactcggga acgggggcca gactggcggg 63120
gtccagcgcg gtcagaccga gacgcagatg tccgcaccag cccagctctt tctcctcgat 63180
ctcgaccagg aagacctggc ccggggccag cggctcgcgg ctgaagcaca cgccgtgggc 63240
gaagctctcc acgcgtgtgg cccgcgtccc agaggggtcc acgcggatgt tggcaccgtg 63300
cacccgatgg aagcgggtgg gagggggctc cgggcgctcg agtccccaga gtgcacccga 63360
atccacgggc tcggaggcag cagccatctc tcggccatag ggcaggccag ctggcgccgg 63420
gggctatttt gggcggcggg caatgatggt gaccgcaagg cgaccttgta aggcatttcc 63480
cccctgactc ccttccccga gcctctgccc gggggtccta gcgccgcttt ctcagccatc 63540
ccgcctacaa cttagccgtc cacaacagga tcatctgatc gcgtgcgccc gggctacgat 63600
ctgcgaggcc cgcggacctt gacccggcat tgaccgccac cgcccccag gtccgtaggg 63660
accaaagaag gggcgggagg aagactgtca cgtggcgccg gagttcacgt gactcgtaca 63720
catgacttcc agtccccggg cgcctcctgg agagcaagga cgcggggag cagaggtgag 63780
ctgcaccgg aggctggagg ggatccccga gcccgggatc ggtgcgcggc agaggaggct 63840
cgcgggtggg agctggcgct ggggccgggg cttccctcgc ggaggcgccg ccagcaactc 63900
cccgggggct gctgcacgga agcgctgagg agcgagtcaa cagccctct gctgcctccc 63960
gtagatgatc cgagccgcgc cgccgccgct gttcctgctg ctgctgctgc tgctgctgct 64020
agtgtcctgg gcgtcccgag gcgaggcagc ccccgaccag gacgagatcc agcgcctccc 64080
cgggctggcc aagcagccgt ctttccgcca gtactccggc tacctcaaag gctccggctc 64140
caagcacctc cactactggt ctgccgccct gccttctggg cgggattggg agaagagatg 64200
acggatgagg gatggggggt agttctgcag acccctgagg atgcctggga gccgggaggg 64260
ctggaaaggg cccctccaac tgcgccaacc ctgccctgac cccccctccca ggtttgtgga 64320
gtcccagaag gatcccgaga acagccctgt ggtgctttgg ctcaatgggg gtcccggctg 64380
cagctcacta gatgggctcc tcacagagca tggcccttc ctggtgagtg gacagcaggg 64440
ggaaagcaca gttcccaaag taaaaggctg gggaaagcga gagaggggct ttgtgatttt 64500
ccaaaaagtt tccttccttc taagcctcgg gattttcctc tatgccattg gctttgctgc 64560
ctgtacctct cagaggtttt acccacatgt aaagtgcctc tcatggtggc ccttccctc 64620
cacccagctg gcccttggga cttactcagc catctctttc ctcctcaggt ccagccagat 64680
ggtgtcaccc tggagtacaa cccctattct tggaatctgg tatagctgga gctgtggggtg 64740
tgtctgggca cttggatggg gtggcattta gctaatttt ccctcccctc tagattgcca 64800
atgtgttata cctggagtcc ccagctgggg tgggcttctc ctactccgat gacaagtttt 64860
atgcaactaa tgacactgag gtgagtctgg tgcctgccca tctgccccag gctccccggt 64920
cctccatcca tggcatgatg ctgggagaga gagcattcctc ttgcacaaat agggtggggtt 64980
tgtcatatgc tattgtggta tggtggccag tcacttcctc ttgcacaaat agggtgggtt 65040
aatgtcatta tctctgaagt tctttccagt tcaaatacca aagcttcctg attccctctg 65100
tcttgctctg ccatccccag gtcgcccaga gcaatttga ggcccttcaa gatttcttcc 65160
gcctctttcc ggagtacaag aacaacaaac ttttcctgac cggggagagc tatgctggca 65220
tctacatccc caccctggcc gtgctggtca tgcaggatcc cagcatgaac cttcaggtgc 65280
agggtagctg caggagggaa gggaggtagc ttgaggctgt ggccttacag ttagcaaggt 65340
cagactgact ggtcaatgtc cccatccaac ccagcttcct gcataacctc cccaccaccg 65400
```

```
gctgccctag gtctgtctgt gtgcctccca cacaggaaac tcacctgtca ggctgccagc 65460
tctgtgtttt gcattgagtg gcctctcata cccaccggcc tacataaacc accctgggtt 65520
tcagcttccg gattgctgaa ggtctgggtg gtagggtgag ggaggctctt ccttttttgcc 65580
ctccacatga gctgagcacc ctgggtgttt cacaggggct ggctgtgggc aatggactct 65640
cctcctatga gcagaatgac aactccctgg tctactttgc ctactaccat ggccttctgg 65700
ggaacaggta tgggataggg cagttgggca atctctgggg tgaggcaggt cacatgatct 65760
caggtctgtc ctccaggcac atgatatgac aggcccagcc caggtttatg agcagcaggt 65820
gggttgcaga aagaacctag tgctgaaagg ccaaagaata gagatcagtt tttctttctt 65880
tctttttttt tttttttgaga cagattctta ctttgtcacc caggctggag tgcagtggca 65940
cgatcttagc tcactgcaac ctccacctcc caggttcaag caattctcat gcctcagact 66000
cccaggcagc tgggactaca ggcgcgtacc accacacctg cctaattttt tgtattttta 66060
gtagagatgg ggttttgctg tgttggccag gctggacttg aactcctggc ctcaaatgat 66120
cttcccaaag tgctgggatt acaggcatga gctacagcgc ccagccagaa atcagatttt 66180
aaaggaacta aggaggcctg tctgtatgac cctggggcac ctctttggga gctagcttag 66240
atgacataca gaccacaccc tgtgatatct ttcccagtct cctagggtca ggggaggttgg 66300
tgggaggtgg ggggtatgct cgcctcctct gccttcctct tcccaccagc agctgatgcg 66360
ctttttcactc tcatctccta caggctttgg tcttctctcc agacccactg ctgctctcaa 66420
aacaagtgta acttctatga caacaaagac ctggaatgcg tgaccaatgt gaggttctgc 66480
catcactttg catgagctct cccatcccta atcctgagaa caggaccaca ttccctcctt 66540
ggggactcct tgttctccgt ccctcattgc tttcttgcac cttttaagcaa tttagtgttc 66600
tctgggacat gtgtctaagt gtgtattccc accaccacct cctatggtgg caaatcccat 66660
aacctccgtg aggagaaagg acttcttcac atttatcaaa cacctgcaac gtggcaggca 66720
ctgtgctgaa ctgtgtctat gtagattatt taagcttcaa gattcccct caaatgagat 66780
catactaccc acattttcca gataaggaaa ctgagggcta tgaattttga aatcactgtc 66840
tgaagtcaca gtgttgggag gcagtgatgc taggatttgg acccaggtct gggaagattc 66900
ctgccactga gcctcagttt ccctacctgt gaaaaaagt gggtgaagag gtgaaatcca 66960
agagcagtaa atcttgggac aacttggtgg ggtcgtggag aggctgggga tctgtaaagc 67020
atggtggctt ggtgtatcat tgcagcttca ggaagtggcc cgcatcgtgg gcaactctgg 67080
cctcaacatc tacaatctct atgccccgtg tgctggaggg gtgcccagcc attttaggta 67140
ggtgctgctg ggtgcccctg gagccaaccc cagccccatc tggaggctcc acacccattc 67200
ccccacctca cattgcaggt atgagaagga cactgttgtg gtccaggatt tgggcaacat 67260
cttcactcgc ctgccactca agcggatgtg gcatcaggtg tgcgagggcg tgggcttcct 67320
cctggtgagg tgggggcagg gggaggggca gggaagcaga ggccctgacc cactgtctgt 67380
gccttccagg cactgctgcg ctcaggggat aaagtgcgca tggacccccc ctgcaccaac 67440
acaacagctg cttccaccta cctcaacaac ccgtacgtgc ggaaggccct caacatcccg 67500
gagcagctgc acaatgggga catgtgcaag tgaggttccg tggccacctg tgacttgggg 67560
tggtgggttg ctggggcttg tgggcatcgg caggtttctc agggatcttc tgtgtagagt 67620
ttctcaatga gatgagctgt agaggatgtt taacatccat ccctgacccc tcagtggatt 67680
gagagtcagc caattcattc ttttatcttt tttaaattta aaattttttt gtttgagaca 67740
aggtctcact ctgtcaccta ggctggagtg cagtggtgtg atcatagctc actgcagcct 67800
caaactcatg ggctcaagca atcctcccac ctccccagta gctgggacta cagacgcacc 67860
accacccca acaagttttt gtattttttg tacagatggt gttttaccac attgctcagg 67920
ctggttttga actctggggc tcaagtgatc tgcccatttc agcctcccaa agtactggga 67980
ttacaggcat gagccacccc gcccagcccc atttcattac gtagccacat tggttgttgt 68040
ttcacagttc actacagcct caacctccta ggctcaagcg atcctcccac cttagtctac 68100
tgagtagctg ggtctacagg cacatgccac cattcctggc taatttttaa aaattttttt 68160
tgtagagaca gggtctcact atgttgtcca ggttggtctc aaactcttgg tctcaagcaa 68220
tcctccctcc ttggcctccc aaagtgctgg gattacaggc gagggtcccc acacccggcc 68280
atcacattgg ttaataacta ttacttccga ctgggcgcag tggttcacgc ctgtaatcct 68340
agcactttg gaggctgagg tggggaatc acctgaggtc aggagttcga gaccagcctg 68400
gccaacatga agaaacccca tctctactaa aaatacaaca attagccagg tgtgctgttg 68460
ggcacctgta atcccagcta ttcaggaggc tgagggagga gaatcgcttg aacccaggag 68520
gcagaggttg cagtgagctg agatcatgct actgcactcc agcctgggca acaaaagtga 68580
aactccatct caaacaacaa taacaaactg ttaacttcca tgtccagtct cctgtggcca 68640
cccccccca caaccccaag taaaagggta acactgggcc cagcagggct gctcaggtcc 68700
attttgattg gtcagtgctc acactctacc ctgttgtatg ttgtgactcc cacacctgct 68760
ggcccctaga cactaaatgc cagatgcatc ccagtcctcg taacaaccaa aatgcgtccc 68820
ttgtacattt cttttttcttt ttttttttga gatggagtct tgctgtcact caggctggag 68880
tgcagtgctg cgatcttggc tcactgcaac ctccgcctcc cgggttcaag tgattctcct 68940
gcctcagcct tctgagtagc tgggactaca ggcacgcacc accacgcctg gctaattttt 69000
gtatttttt tttagtagaga cacgggggttt caccatgttg gtcaggctgg tctcgaactc 69060
```

```
ctgacctcgt gatccactca cctcggtctc ccaaagtgct aggattacag gcgtgagcca 69120
ccacgcccag catccctgta cctttctaaa tggtggtgag ttgaggctgt ctgaatccca 69180
gcccatccag cccaacatcc aagtcagtcc tagagaggtg gccccccccc aaaaaggggga 69240
gtggaaccca gctgtctgcc ttctgggttg gagcttggag ataggagaga aggtctgatc 69300
tgttgactac ttttcgcccc gacctggtct tcctggggcc tgctcgtatg ttcccggcag 69360
ctttctggta aacttacagt accgccgtct ctaccgaagc atgaactccc agtatctgaa 69420
gctgcttagc tcacaggtga gtggggagag cacagctgga tcaccagcag ccttaggacc 69480
ccagagtagc acagcaagct gggggccctt gagacttcct gtcaggacaa gggaagctga 69540
aactccgaaa ggcgaagccc agggtcctgt gattggtggg gtcagaattt gaacctgggt 69600
ttgtccccac ccatgctgtc ctgctatagg aggcctaggg gtctgcatca gccacggagt 69660
cttaagggtg agaagagctt cattcatgcc aaaaatgggc cagcagaggt ccagggtggg 69720
aggagacctt gcacaaggtg atataggaag cactggcagg gccaagttag gactaggttc 69780
tgtccagcac agtggttaat agcatgggct ctggagtcac atggcctggg tgcaagtccc 69840
tgtactagcc acataatctt gggcaaattt cttaaatatg agcctcaggt tctccatctg 69900
taaaatgggg ataataatga tatctacctt cacagataaa acatttagta gaatactgga 69960
catgcagtaa gtcgttagaa aacatgaaaa ttccctggtt cgtgttatct agcttggccc 70020
cttgaatttc ctgaggggta ggccttgaac tagggaaggg ctgggactg ggcttgttcc 70080
acacccctca tttttacccc atcctgcttt agaaatacca gatcctatta tataatggag 70140
atgtagacat ggcctgcaat ttcatggggg atgagtggtt tgtggattcc ctcaaccaga 70200
aggtaaggta gagattcctg gccctgggat aggggctgct gtggaggatt gggagcgggt 70260
atgcctggga gtggccagct ggctgcctgg ctctggccca cagagggcaa gtgtggagga 70320
attccagcc ctaaggtctt gctggtagct gtgagcaagg atgcagctgc tgtaggctga 70380
tgtctttcct ggtggggcag atggaggtgc agcgccggcc ctggttagtg aagtacgggg 70440
acagcgggga gcagattgcc ggcttcgtga aggagttctc ccacatcgcc tttctcacga 70500
tcaaggtagg gactgggcct gctgagagat aactgggccg gaggcaaagg agcaggaccc 70560
acccgtcctt tccctctggc tgcctttag gctgggtcat gggtcaccat ctggccctg 70620
tatgggcaag ttttttttgga gaggggtggg gaggttctg ggaagaataa agggtttggg 70680
atgaaggaat tgcccccgag tgagcagtta tatgggggg agggaatggt ggggtcagga 70740
gctcacgaac attgctcctc agggcgccgg ccacatggtt cccaccgaca agcccctcgc 70800
tgccttcacc atgttctccc gcttcctgaa caagcagcca tactgatgac cacagcaacc 70860
agctccacgg cctgatgcag cccctcccag cctctcccgc taggagagtc ctcttctaag 70920
caaagtgccc ctgcaggccg ggttctgccg ccaggactgc ccccttccca gagccctgta 70980
catcccagac tgggcccagg gtctcccata gacagcctgg gggcaagtta gcactttatt 71040
cccgcagcag ttcctgaatg gggtggcctg gcccttctc tgcttaaaga atgccctta 71100
tgatgcactg attccatccc aggaacccaa cagagctcag gacagcccac agggaggtgg 71160
tggacggact gtaattgata gattgattat ggaattaaat tgggtacagc ttcaaatccc 71220
gtcttctctg tggcactggg ggttagaggg ggcactacag gctatgaatg tgggaaaaga 71280
ggggctgaga ggggttgggg tcctgaatga cagctgccag cttggggatt gagggctcag 71340
acagctgctg tggacggtgt ggggcagtg gacgccctga catcagcagg ccggttcttc 71400
tcaatcacct ctcgcagccc tttggcaaag tggagatcag ccccgatggt gaggaatccc 71460
tgtgttgggg agaggggagc ctcatttatt cattcagtta ttgaggccag agtttagaga 71520
tcaagagaca gagtgtttgt ctttcaggaa ctcaatctaa tggataattc catgtcaagg 71580
tgttaaaatg aggctgtagg agtgtagact atgggtgtca aggagggctt cttggaggag 71640
gtgacctctg agctaagacc tgaacaatta gtaggtattg ggatgggaga agagtgctcc 71700
aagaagtcac agtgtgtgca acggctttta ggagtctaag attaaaatgg gaggggcgac 71760
tggtaatggg ggagctgggg tcaggtaatg gagggcactg gggagctata gagagagggg 71820
aaggccctcc ctccttcccc atcctgcccc cactcaccgc atggttcgtc accacctcat 71880
gcacaaagtt gatgccctca ggtagtggga tctgcacccc acgccaggtc cgctctgtgg 71940
gtgggagcac cccgctcagt ctgggcccgc ccagttcacc cctcctttct tcctccatcc 72000
tcacacccca gccttaccat tgagcatggg catcacccca atctgcagca tggtcttcag 72060
aggggcctgt aatgggatca gctgggaggg gcgaggcgg aaacagggca gtgagtcagg 72120
gttgggtttg cctttagctg cccgcaggtg agcagttata tgaggagggg gggatggtga 72180
gggtcaggat ctcacgaacc cagcccagcc cacccaccct tccccactca cagccagcga 72240
ctccagtgca gaatggttgg aatagattcg gaacctgcgg gaaagaaagg agccctgtgg 72300
gcaggaagcc tggaagctcc ccttcctcag gccacccagg cctacctgcc agaggtgtct 72360
gagttgcagg ctcagatgcc cacctaggca cctttccaag tgctacaact ttccaggtat 72420
cctcggggca gtcattgctg ccacttgggt ctcctttct ccaagactgc tacttttat 72480
ttattgagca cctcttttt ttttttttt tttttttttt ttgagacaga gtctcgctgt 72540
gtcgcccacg ctggagtgca gtggcgcgat ctcggctcac tgctccgtct cccgggttca 72600
cgccattctc ctggctcagc ctcccgagta actgggacta taggtgcccg ccaccaagcc 72660
cagctaattt tttgtgtttt tagtagagac ggggtttcac cgtgttagcc aggatggtct 72720
```

```
cggatttcct gaccttgtga tccgcccgtc tcggcctccc aaagtgctgg gattacaggc 72780
gtgagccacc acgcccggcc tttattgagc acttctaatg tgccagactt ctgctggtag 72840
ctttgcaggt gttatttatt ttatgtaaca aaacttcaca ttgcttagtt cctgtcagac 72900
actaagcata tttattttct ttttttattt ttatttattt ttgagacagc gtctcactgt 72960
gttgcccagg ctggagggca gtggtgtaat tttactcact gtggctttga cctccagggc 73020
tcaagtcagc ctcccacctc aggcttccaa gtagctggga ccacaggcgt gcatcactat 73080
gaccaactaa cttttaaatt ttttttgtaga gacaggatct cactttgtag ctcaggctgg 73140
tatcgaactc ctggcctcaa gcgatctacc cgccttggtc tcccaaagtg ttgagattac 73200
aggtgtgagc cactgcaccc agccaacgtg tttaaaaagt taatattagt aaactgtttt 73260
aaaatacagt accaactggt ttagtcctca aaacaagccc aaggagtggg cactattagg 73320
atttgcacta atttatagat gaggaaaatg aggccctgca aggttaagta atttgcctga 73380
agtcacacag ctggaaagtg tcagaagctg cctctagaac ctagggtcct aacctacatt 73440
atctccttta accttagaac agcactgtcc agtcagattt tctgtgaaac gttttgtatc 73500
tgcaccgtct actatggtag tcactagcca catgtggcta atgaaatgtg cttagtgca 73560
actgaaaaac tatttaatta taattaattt aaatgtaaat agtcacatgt ggctagtatc 73620
taccatattg gatagcacag ccctagaagg cagatgctac ttttgcctgt attaaacaca 73680
tggagaaaat gaggcctaga aagacaaaat gggctgggtg cggtggctca cgcctgtaat 73740
cctagcactt tgggaggcta aggtgggacg atcacttgag cccgagaatt ggagaccagc 73800
ctggacaaca aagtgagacc ccatctctac aaaaaataaa atagtcaggc atggtagtgc 73860
atgcatgcag tcccagttac tcgggaggct gaggctggac gatcacttga gcccaggagg 73920
tcaaggctgc agtgagctat gattgcacca ctgcactcca gcttgggcaa cagagtgaga 73980
ctctgtctca aaaataaata aatacaataa aataaggcca agcacagtgg ctcataccta 74040
taatcccagc actttgggag gccggggcag gtgaatcacc tgaggtcagg agtttgagac 74100
cagcctgacc aatatggtga aaccctgtct ctactaaaaa tgcaaaaatt agccgggcgt 74160
ggtggcgcac acctgtaatc ccagctactc aggaagctga ggcagaattg cctaaacccg 74220
ggaggcagag gtggcagtga gtcaagacca cgctattgca ctccagcctg ggcaacaaga 74280
gcgaaactcc ttctcaaaaa aaaaaaaaaa agaataataa cattttaaaa aaagataaaa 74340
tggcctcaag gtcacaaagc tgtgttgtgc tgaggttttt gtcaaaaccc atgttctgat 74400
ctttgctgtg tgactgtggg catgttattt aacattgctg gacccatttg ttcatctctc 74460
ataatacctg ccctgcctgc ctctgggaca tgtgagaatg cagaggagtc agactttacc 74520
aaagcacttt ggcatgcatt aacaaagaca gaccccagct ctcagtggct tacaggtatc 74580
actgtacttt aagcgcaaca tccctgtgga caggtgtgat tgtcctccaa tcactgaggt 74640
gcagggaagt gcgcctgcct acctgcgcag gtccagctgc gtgcgcaggg ccttcccccg 74700
gagagccatc ttggcgctga gacgggcgtc ctgcaggaac atggggagga ggatgttact 74760
gacccagaag gtcagtaacc cacagcccat ttttccctga cccccagcca gcagcccca 74820
ctctgggacc cgtaccatag tcatgctgga cagctggacc tcaggctggt ctggtgggac 74880
cagggcaatg gtgacgctag cagtgacaga gatggtggtg ccagagggct tgatggtgca 74940
gcgcggtggg gccaggaccc gcagctccag cttcaatggg gagtcaatca ctgctgggct 75000
ctgggggatg agcagcaggg gcgggtcaag tccctgccat ttcctttgga gcccccaggg 75060
aagaagggga aggaaggcag gtgcagcttc tgtcctctgg ggactctcat attgcaaata 75120
cagagggagc tctggcttcc aaaactctca catctgcatc tagccttcat gcctttgcca 75180
cacaaagaaa caggaatgtg ttcttctctt tctgcttcct aaatacatct caatattcag 75240
gtctatctcc aatccagact ctttgtggat gtccttttg cattagtatc tcagcccttg 75300
ccatgtcttc tgttttgat atggagtctc actttgttgc ccaggctgga gtgcagtggc 75360
acaatctcgg ctcactgcaa ctctgtctcc caggttcagg cgattctccc gcctcagcct 75420
cccaagtagc tgagattaca ggcacctgcc gccatgcccg gctaagtttt gtatttttaa 75480
tagaaacggg gtttcgccat attggccagg ctagtgattc gcccacctcg gcctcccaaa 75540
gtgctgggat tacaggcatg agccaccaca cccaaacccc ttgccatatc tttttgctct 75600
ctctctcctt tttttttgag acagggtctc tgttgcccag gctggagtgc agtggcatga 75660
tcacggctca ctgcagcctc aacctcctca gctcaaatta tcctgccaca tcagcctcct 75720
gaacagctga gaccacaggt tcatgccatc acgcctggct tatttttgta tttgtttttt 75780
gttttggttt ttgcttttgt gttttcgtag agacgggggtt tggccatgtt gcccatgctg 75840
gtctcaaact cctgggctca agtgatctgc cggcttcagc ctcccacagt gttgggatta 75900
caggcgtgag ccaccgtgcc tggccatatc ttctttctct aaactgctat gccttcttct 75960
ataggcagtg aaggaatact ataagatgca actgcctaat cttcaccaaa catgattcta 76020
aacactgtat atgtgttggt tcctttaaac ctcataataa ccatgtgagg ccgatattat 76080
tactgccaat tttgttgttg ttatttttta caaatttatt tttcaggctg agtcgtcatg 76140
gcagagaatt gcttgaaccc gggaggttca attgcagtga gccaagattg cgccactgca 76200
ctccagcctg ggtgacagag tgagactttg tcccccacc gaaaaaaaaa gatctgacta 76260
aaaatttatt tttcaataga gacagtgtct cactgtgttg cccaggctgg tctcaaactc 76320
ctgggctcaa gcaattttcc taccttgacc tctcaaagtt ctcagagtat aggcgtgagc 76380
```

```
catcatgccc agccatatcc ccatttttga gatggggaaa ttgaggcaca gataggttaa 76440
gtaacttgta gaggttatgt agttactcag tttcagaact aggcttgaag cccaggcagt 76500
ctgacaatag agaccctgcc ctgccataaa ttggatgatg ataatgactg aattatttct 76560
tttaaaattt gtaattctgc taggtgcggt ggctcacacc tgtaatccta gcactttggg 76620
aggccaaaaa tgggtgatca cttgagccca ggagttcaag gacagcctga gcaacataat 76680
gaaactctgt ctcaacaaaa tataaaaatt agcgggggtgt ggtggcacaa gcctgtaatt 76740
ccagctactc aagaggctga agcaggagga tggcttgagc cctgggaggc agaggttgca 76800
gtgagcctag attgtgccac tgcattccaa cttgggtgac aaagtgagac tcttgtctca 76860
aaaaaaaaaa taaataaaat gtgtaactct tactctcctc cccaatacac aaataaacaa 76920
aagtatatgt gaattattat taaagccctc acacttgcaa agcttgggtt ctcactaatc 76980
ctcacagcag ctctgcgaag gagatggggc aggaaggagc aggaaggagc agaccgcttc 77040
acagacagga acagccatga caaggcgagg gggattggcc acagacaaga ggccagggcc 77100
ctgtctgcgt ggctgccact gggggcccca cctgcacccc tccttggtct cactggtgtg 77160
caggtggccc tatccctgcc cccgccagca ctcaccagca ggacaatgct cccaaaagtag 77220
gtggccctca gcagcatgtc caggtcgtgg ggcacctgaa caggggaatc aggagtgagg 77280
gagtgagctc tgtcacagac cttctcttgc ccatcccaca aacaggccat gacatacctt 77340
gtcccccacc agcaacagct gcagggcccc cgcccggaag tagctctcca tggcagagtc 77400
gaagaagaac tcagagaagg ccacatacac catccgctct tcctcctgca gctggggctc 77460
cactgcccgg ttggggaggc tccagttcct ctcagtcagg gggaagaagg ccccctgggg 77520
tggggcattc acagtcaggg tcaaggcaga ctggcctggc acctggactg acagcaggtg 77580
tctcccagcc ccgtgctagg cactgtgggg ggatggtggg aacccagctg ctgttcttgg 77640
aggattcaca agcacatctc ttaaaaggca ttggaaggag gacacctgct accaggggggc 77700
gagcccgtca gactggagga gggagggtca ggaaaggttt cagggaagag gtgacatctg 77760
agtgggcctt gaaagctaga ggcagtaaca acagctactg tttacatata ttgtgcatac 77820
tcatgcttct ttgccaagta ctctaagctc ttcacataga tcgacttctt taatctgcat 77880
aacaacgtgt gttttcttac tagattattt ccatttacat gttaggaaac tggccaactg 77940
aaaacttatg cttagggccg tgcagctagt cagtggcaga gctaggattt gaacttcagg 78000
cattcttttt ctctttgtag agaaggaggt ctcactatga tgcccaagct ggtctcaaac 78060
tcctgggctc aagcgatcct ctcgcctggg cctcccaaag tattgggatt acaggcatga 78120
gccactgcac ccgactgatt ctagctcccg agtctgcact ctgaaactgc tatactcctc 78180
tgggagacca aaggtagtgg ctacacactg gctatgtggc cttgggcaag tgacgtcacc 78240
tctatgagta agtctccaca ttcctaaaat taggatgatg ttagtacctg actcacaggg 78300
ttgtgagaga atgaaatgag attatttgta tagaaattta tgtccagctc cttcggggga 78360
gttggggaaa ggccgtgcat gagcaaaggc cctgaggtgg gaagccaggg tccaatttgg 78420
gaaagagcag ctgcaaagaa acaggatgag atataaaagg tggggccagg taagattaac 78480
aggggctcaa atgccagacc caggaggctg aacctaattc tgtagtaaca gggagccata 78540
gcattctcag taatgggagt ggcctcatca gagctgtgct ttaagaagta aaatcttgca 78600
acttagcaga gaaagaggtc ttgttaggaa gtcagaggtc atacaccagc ccaagcagct 78660
cacccggaag tccatgtcca ggttgctggt ggaagccaca ggatccttca tgagggaata 78720
gtcaatgcca acaagctcgt ccacagaact gcgcactgca ggaaggggct caagtcactc 78780
acggctgtgt gatgtgggat aaggtgctta acctctccag gctcagaggc ccacccataa 78840
aatgaggata catccttcac agggttgtca tgagggtcaa attagtttta tgtggaaagc 78900
acttagggcc tggtgtgtag ttaggtgctc attaatgtta gttattatta ttactaccac 78960
tatagaggtt tcaaaaaaat aactaaacaa gatggcatgg gggggccgcg catggtggct 79020
cacacctgta atcccagcac ttagggaggt caaggcgggc ggatcacctg aggtcaggtg 79080
ttcgagacca gcctggtcca ccacggtgaa accccgtctc tactaaaaat acaaaaatta 79140
gttgggcatg gtggtggggcg cctgtaatcc cagctactca ggaggctgag gcaggagaat 79200
cgcttgatcc tgggaggtgg aggttgcagg gagccaggat tgcaccactg cactccagcc 79260
tgggtgacag agcgagactc catctcaaaa aaaaaaaaga aaaaaaaga tggcatgagg 79320
ttcctttccc ttggtttctc ctacctcctc cttcgcttcc catgcctgtg tgttaggtgt 79380
gatgggaaaa tacctttgcc ccacagtaga cagaggtcat ggcttagaaa aagggaattc 79440
atggccaggc acagtggctc atgcctataa tcccagcact ttgggaggcc aaggtgggca 79500
gatcaggagg tcaggagatc gagaccatcc cggccaacat ggtgaaaccc cgtctctact 79560
aaaacacaaa aaactagttg ggcatggtgg tgcacgcctg tagtcccagc tactcgagat 79620
gctgaggcag gagaattgct tgaacccggg aggtggagat tgcagtgagc tgagatcgcg 79680
ccactggact ccagcctggc aacagagtga gactgtaaga ctccgtgcaa aaaaaaaaaa 79740
aaaagaaaga aaagaaaaa gggaattcat gttaattgag cacctattag atgctaggtg 79800
atgaagacaa atgggatgcc agtgacatat tgaggacctt gacaactatt 79860
ctctcagata atcctcacag caaccccagg aggaggcact gccagccaag tgaggaaaca 79920
agcactttgc ccagacagaa atgagcactt cacccaaaat cgcacaacaa gtcagctcca 79980
ggggccacat ttgaacccag gactgttcaa cagcagggct cggaagggggc ctgctctgag 80040
```

```
gtgctgcatg acagctgcac acccagactc acccgccacc aactcaccag gcacggtgtc 80100
caggagggag ttgagcagga ccgtccctgc gtggtagagg acaggcaga tctgcgaggt 80160
gggagccaga gtcagggcct tctcaaagtg agagcatgcc cacccttgcc accctgcgac 80220
ctgtcgctgc ccacacctgc tggttgagga ggaagcgcat ccctgaggtg atgaacgtgg 80280
agagaaaatc atacaccttc ctgtgaggag aggagaggcc ggatgagccc agaacctgcc 80340
tccaccccag tccaggtcca ggagaaatca gtgactaggg aaatagtggc agtaggagtc 80400
ctcagcttca gcctgaataa cagctcctcc acgtaggttt tccaagaacc aggcccaaat 80460
tccctctcca gtctaattct caagacctcc tgacctactc tctggtccca tcagtcaaat 80520
gaatccaccc acattgcctc aaacccactc tgagcatccc cacatccatc ggcttactga 80580
tgccctccct tccgccctct gcattcctac tctgtatttt cccatctgag ctcagatgct 80640
tcctcttcca ggcagtcttc ccagattccc ctcctctgaa tccccaaagc atttttcttag 80700
tccttctctc caggccctga tatcaaatgt ttttttgctcc agataggctc tgagctcctt 80760
cctgcatcct cagggactgg catacacttt gtttgatgaa taaataaatac tgacagtgta 80820
ccaacaccag gttataatcc atcatcttct ctcccccatc ctcttccaga acaagaacaa 80880
tatccccttc tcagcagcaa aaataaaaaa ataggccggg cacagttgct caggcctgta 80940
atcccagcac tttggtaggc cgaggcggac agaccacctg agatcaggag tttgagacca 81000
gcgtggccaa tatggcgaaa ccctgtctct actaaaaata caaaaaaagt agttgggcat 81060
ggtggtgcat gcctgtagtc ccagctactt gggaggctga ggcaggagaa tcgtttgaac 81120
ccaggaggtg gaggttgcag taaaccgaga tggcgccact gcactccagg ctgggtgaca 81180
cagtgagact ccctctcaaa aaaaaaatta ttattttgt tattattatt tagagatacc 81240
aattattgag aatccagtac atggccaaat gtgcatatca gatagtcctc acagttactc 81300
ttatctaagt ggccagcact taaatataca tttatcatat gccaggtgct gttctaaatt 81360
tttttttttt tttttttttg agatggaatc ttgctctgtc accaggctgg agtgcagtgg 81420
cacgatctca gctcactgca acctccgcct cccgggttca agcgattctc ctgcctcagc 81480
ctcccacgta gctgggacta caggcacgtg ccaccacgcc cagctaattt ttgtattttt 81540
agtagagatg gggtttcacc atgttggcca ggatgatctc gatctgttaa ccttgtgatc 81600
cgcccgccca gacctcccaa attgctggga tttcaggcat gagccaccac agccagcctt 81660
gttctaaata ttttttacat ataccaacac aaataatcct gacaacgatc ttataaaata 81720
ggatcttata aaatgaggat attgaggcac caagcttcag tgacttggcc acgttcacac 81780
agccaggaag tgacagagct gagctttgga cccagttggt ctgattccca ggcctatgca 81840
ctttgcattg cgctaggcag atgagctgtg gggctcgaaa agggtgagct ggggttgggg 81900
ctggggctta cttgaaggtt cccccgaagg ccgcgtgcat tctggagaca gaggcctggc 81960
aggagacatt ggacactttc atccgtccag cgggatcccg ggagagctcc agaccagtgc 82020
ggatggacac accctcagct gaggcgttga tgtagccccc atcatagctg ccagggggggt 82080
taatattcac tccaggtagg agctcaattg agtcttcagt gcccccatgc atcaccatac 82140
ctcttaataa ggtttcacct ctttccacac atcctaccaa accttcctat caactcgtat 82200
gaaatgcata tgcctgtttc tgttacacag atgaagaaac ggaaactcag gaaggctaag 82260
ggggctgccc acagccccac agcacctcca gccctcctga cccactctcc actcccctga 82320
gggtgctggg tccttacaag aaccagtaga gcagctgtct ccggaagcgc agccccaagg 82380
aggcattggt gatttgaagc atcagctcct gctgtggctg gaaatcgagc tcggaagatg 82440
tcagttgcag ctctgtgacc ttcaccctac aggaggcctc agggtcagat ccaggccaa 82500
gaagagggaa cttcccccaa cgacaggaaa tttgtctgct cccctttcaa gtccaggcct 82560
ggggaagcgg gagtgggtgg aatgaattct tccattgtcc ctcaagtgcc caacttagac 82620
ttgggtggct caaagttgaa cttgggtggc tgagagagga ggtcttcctg atccaggtgt 82680
taaaaatgag cttcacccca tcgcttaaaa gtcttgtttg tttgtttgcc aggtgcggtg 82740
gtggctcatg cctgtaatcc cagcacttta ggaggccgag gagggcggat cacttgaggt 82800
caggagttcg agaccagtct ggccaacata gtgaaacccg tctctaccaa aaatacaaaa 82860
cttagcagac cgtggtggca cgcgcctgta gtcctagcta ctcgggaggc tgaggcagga 82920
aaatcgcttg aactcgggat gcggaggttg cagtgagcca agatcgcgcc actgcactct 82980
agcctgggca acagaacaag actccctctc agaaaaaaaa aaaaaaaaag tcttgtttgc 83040
ttgcaccccc tcccctccca caccctgggg ttgctacacc cggtctttta atagagtccg 83100
ttcactttgc ctccatcacc taagctccgt ctcacatctc aattccttat tcccctccc 83160
tcatcctaaa ccatacttag agccttcagt ttctccaccc ctccgattaa ctccaccccg 83220
tgcccgagac tccactctca tctattggga agttccttga ctccacctttt ctgttgttct 83280
tcgaccacgc ctcacatcca ctggtcctgc ttccttcttg gcccctctca cattttcaag 83340
gccacgccca tctgcctggt cccgcctatg atgactggct tggcctttat cttttcggcc 83400
ccatccggtt tcttaagtct tgcctcatcg atttggccac gccccatccc actcagcctc 83460
cagtctcccg agacctgag atttctcggg ccccgcctcc accgccgagg ccccgccccg 83520
gatcgcgagg ccccgccccc cacttactca gagatgttgt agtagaagtg gccttctttg 83580
ccccgcaggt ccggaatggt gatagtctcc agctcttgct ccagaaagcg cagcccctcc 83640
tgcttcactg aagcagcaga gaaacccttta cttagctccc gtgcccactg ttggggcgac 83700
```

88

```
cccaaccccg tccgctcccg tccgtccctg tctgcccctg cgccttaccc agctccagcg 83760
ccttggaggt gacgcggatc ttgcagcctg ggaactctgc atgtgcgcct gccagcagcg 83820
ctaggaagag ggccccgaag agggccatgg cgagcgggcc tgggggtggg gtggggtcgc 83880
aggagttatc tgagccgctt aaacccattc cttggacgtc caaccataag tgggaactag 83940
cctggatcgt taccctccag ataactcttc ggggaacttg gaaccaataa tcttgcctcc 84000
atatggcaga tgtggaaact gaggctcaga gaggcgatgc gacttgcgtt ctggctccca 84060
gaggatttgg gacacggggg aggggacgtt cccagttccc tcgtgctacc gccgcgtgat 84120
gagtttggac ctccaggggа ccagcccccа caccccaac aacctcccct ttcctttagc 84180
ggtgggccca tgcaggcttg cacgttgcca cggcaacgac tgcacgcgca ttcttggagg 84240
gtggcttgcg gtctcatagg cctcgcgccc ggggaggaga ggaggtggcc gaccagaccg 84300
tgggctcccg ggtctcccgg ctccctcagg tcctaaatct ctcccattag agattctgcc 84360
tggagccccc atgttagcgt tctccttcat cggctctcct ccccacgccg gcttcagtgc 84420
accacgcggc tcggcgaggg actgggaacg ggatagggac gcgccccaac tcactcagcg 84480
gtggagctgg ggggcggcgc ggtcacgtgg gatggcgggc agctcagggg atccgggcga 84540
cggggtctgg cgggcagggt tgttccagcc gcctttataa agccggcctc cccgacccct 84600
cctcctctct gcagctctcc cctcctccct tgggggctgg gaggggacgg ggcgggacgg 84660
tggcagccgg gagagtggaa aaggctgcac agagccccgt gacaagcccg gccgctgtct 84720
ggacaagtgg gagacccaag cccagggaga gggaaggaaa tgcaggagcc ggcccactca 84780
gccccaacaa tcccactttg ctgggacctt ggttcaaatt acaattatcc atgtcttcct 84840
gcatgatctt gggcaagtca cttcacttgg gtcactgacc ctcagtttct tccttcagcg 84900
aaatgtgcac gatgatagga actacctctt gggcctttat tacaaccagg tccaggcaca 84960
aagtcaagga atatttttc tttccctgcc acccacaatc atctcgggac ctccttgcct 85020
ggctttgcta tgggcccccc tacctgtctc tgtgtcacca cctggggacc ttaaggtccc 85080
agagacccttt cccacttggg aaagcaagac tagacaagtg ctgtcagccc aggaacatac 85140
cacaccggct gaaatcagaa ggaggtctgc catttatcgt ggctggtgga ttgttttttc 85200
tatttttttt attttttattt tttgagacgg agtctcgctc tgtcccccag gctggagtgc 85260
agtggcgcga tctcggctcc ctgcaagccc cgcctcccgg gttcacgcca ttctcctgcc 85320
tcagcctccc cagcagctgg ggctacaggc gcacgctgcc acgcccggct aattttttt 85380
gtatttttag tagagacggg gtttcaccgt gttagccagg atggtctcga tctcctgacc 85440
ttgtgatccg cccgcctcgg cctcccaaag tgctgggatt aaaggcatga gccaccgcgc 85500
ccggtccact ggtggatttt ttaatgaacc cttggagcaa ggtgctctga acagcatccc 85560
cgcccccacc cccaccccca cctccatcta ctgcttacag ggttcccgga ccctaggaca 85620
gggcacagag tgggtgcttg ccaccttttt gttgccaaat ggacgaaaga aaggggaagc 85680
aataatcatg tctgctgagc atgtatttag caccaaacac tcatctagga aggatgacta 85740
actcatcctg atttgcctag gactttcccc attgtgtctt ttttttctga tataatccac 85800
agattcacaa aaatagttcc atttccttttt ttatttaatt aattaattaa tttttttgag 85860
acacagtcgt gctctgtcac caggctgcag tgcggtggtg tgatcttggc tcactgcaac 85920
ctctgcctcc tgggttcaag tgattctcct gcctcagcct cccaagtagc tgggactaca 85980
gccatgtgcc accacacctg gctaattttt gtatttttag tggagacagg gttttgccat 86040
tttggccagg ctggtcttga actcctgccc tcaagtgatc                          86080
```

<210> 59
<211> 804
<212> DNA
<213> Homo sapiens.

<220>
<223> Genbank Accession No. W22366

<220>
<221> unsure
<222> (1)..(804)
<223> n = a or c or g or t

<400> 59
```
tttnggccag cngtgctggg gagggaggaa gggtgatact ccagggttag ccgtcttctt 60
ttggggggtgt gtaccagccg ntttttttcgt ggatctgcac caaggacttg taggactgct 120
gtgctcttgt cagactgtat tgagatttgt tggctccaaa ctgcactcgt gctttcccct 180
tcaccagtgt ggcactgatc tgcatgatca ctgactctat ggagtaggca ctgctccagc 240
cctgtttggt gagaagttcc atgcagatgg cccctccgcc cagaacatac cctccagaga 300
ggactggaga cacaaccctg acaaatgggg ggtcaaaggg aaagttatct ttaaaggaaa 360
```

89

```
aagttaagta ggaattgaag tcgggntcct tctttctctt tgganggatc tttggagatc 420
gnnggnggca aaaggngntt gtcccngggg ncaaacttn gggggggagg gttgggnnaa 480
atcccaantc aaatncaaag acntttgcca antnccaaac ggagntttcc gggcntttta 540
aatttgggnt ttccccnccc cctnnggggg aaaacntccn ttngggnaac cccggggat 600
tttttttttt ttccccccga aaagnntttc cccttnncca aaanaaaaaa nccccgggnc 660
caaaaaaggg gggggcccccc nnnaaacccc cnggggggccc caaagagnna nnattttnna 720
aacnccccaa annnnnnnng ggggggnaaan ncnntttggg gcccccccnt cggggggncc 780
ccccctttnn nnnnaaannc tctn                                      804
```

<210> 60
<211> 691
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI433892

<220>
<221> unsure
<222> (1)..(691)
<223> n = a or c or g or t

<400> 60
```
cacaatatgc atttattaat gaatgtattt atacacaata caaacgtgcg gggacaccgt 60
ccccttcaca gcccagaacc caggggtcaga agatgaggga tccagcctca gaggggagat 120
atgcgacttc ccaagagcag ttcttggcct ggaggggcca tgagagtgca agacacgggg 180
ccgtggccgg ggcggggcta cgggagcggg gcgtggccgg ccccctgaggt tactataggg 240
gaatgggccc cggccaggtc ccctctcctt ggggcagtgg gaagacagcg gggcccacgg 300
gccagagctg ctacacgtag gcgtttctgc cgtatttgcc aaagctgctg tcgccttctt 360
ggtccgaggt ggcgacgggc atcacggaca cgggagcctg gtaggccgc cgggcgctgg 420
cggctgggtc ctcgtcagag ccgcagcagc aggcggagca gaggcagagg ccacccagga 480
ntgagatcag tgaggcgctc caccccaggt agagggcggt gcccagctcg tacttggttn 540
ccgggtacaa ggggtccgag aagtccccgg gtgatgtgna gggcgtacan gaggatggca 600
ccatcccgca gatacccggc aagattgtga ggggcccctg cgtggcccgc agcttggctt 660
tcctgagagc tcaggcccccc aatgtggtgc a                             691
```

<210> 61
<211> 537
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AA029831

<220>
<221> unsure
<222> (1)..(537)
<223> n = a or c or g or t

<400> 61
```
ctggtgatag tcacagtggc cgagtgagtt tcttgggggc ccagcttcct ccagaggtgg 60
cagcaatggc ccggctacta ggggacctag acaggagcac gttcagaaag ttgctgaagt 120
ttgtggtcag cagcctgcag ggggaggact gccgagantg ttgcagcgtc ttggggtcag 180
cgccaacctg ccggagagca gctgggtgcc ctgctggcag gcatgcacac actgctccag 240
caggccctcc gtctgccccc caccagcctg aagcctgaca ccttcaggga ccagctccag 300
gagctctgca tcccccaaga cctggtcggg gacttggcca gcgtggtatt tgggagccag 360
cggccctcct tgattctgtg gccagcagca ggggctggc tgccgcatgt tgcttgactt 420
tcggttggcg ggtggatgta acaatctcca ccagtgccçt ggctcgctnc ctgcagccga 480
gcgtnctgat gcagctgaag ctttcagatg ggtcagatac cgctttgagg tccccac 537
```

<210> 62

```
<211> 592
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI279571

<220>
<221> unsure
<222> (1)..(592)
<223> n = a or c or g or t

<400> 62
tcgtaaatca aagtactatt ttattaaatg agttatttta cacaatatga acatcaatat 60
aattacaatt gtaaaaaaat tttttataac aaggatggac tgattttcat atttccaaat 120
cagagtcaac tgtacattta cacagaattg tctttgcatg aagcccaaga gggaacagca 180
taaaaatgag tgtttctgta gccccttat ttttgctgat caacagtttg ttagaaaagc 240
agctgcaggt atgttaccta aggtctgaga cagtagaaga gtcaaaggtg tcatgaattc 300
acctgtaaac aaccttatgc ctgaacatca gctaattctg gaggaagtgg agtcttagga 360
tgcttgctct caaagtgctg cttgaaggtc ttagggtctg gcatttgtgt cctacagaca 420
gtgcaggtat atattaaggc agctttggca gcagcctttt ggtcatgtcc ttgtttcttc 480
ttttgtccag cttgcttttt ggcattttc tgctgagact gaattttctg ctgtccacga 540
gccatatccg ggccgngaca gtcttgcgtc ggagagacag tgcagcgcga ga        592
```

```
<210> 63
<211> 460
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI982714 .

<400> 63
tcatttttat ttatttattt atatttaatt ttttttcaga catcagtgtt acttgccaag 60
accctcattt ttaaactcca acgagttatt acgttccttt ccactcttgc tttccaattc 120
ctacaccaag acaactctgt attttgagta tatgagtcaa .gtatggcaaa aagtacagta 180
ccttaaaaac ttttattta gtccttcctg gcccatgcta aaactatat ctagaaatac 240
ggcaaaacaa aatgaaacag atctctcctt gtacataaaa cagctaaaaa tttggcctct 300
ttattgatct tatgtcatgt atttggcttg aaaaaaaaaa caacaacaaa acaaacagtt 360
acaagggtta aacaaactaa attttttcttc taaatctcta aatgctcata gacagccaac 420
ttgcagggca tacacagtgc cttgagagtc ggtcccacag               460
```

```
<210> 64
<211> 2805
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. D87442

<400> 64
ggctacggca gggggtggct ctggggctga cccgggaagt cggggtctcc ttcgccttct 60
gtctttctgc gtcctactag caggtttgtg caggggaaac tcagtggaga ggaagatata 120
tatccccta aataaaacag ctccctgtgt tcgcctgctc aacgccactc atcagattgg 180
ctgccagtct tcaattagtg gagacacagg ggttatccac gtagtagaga aagaggagga 240
cctacagtgg gtattgactg atggccccaa ccccccttac atggttctgc tggagagcaa 300
gcattttacc agggatttaa tggagaagct gaaagggaga accagccgaa ttgctggtct 360
tgcagtgtcc ttgaccaagc ccagtcctgc ctcaggcttc tctcctagtg tacagtgccc 420
aaatgatggg tttggtgttt actccaattc ctatgggcca gagtttgctc actgcagaga 480
aatacagtgg aattcgctgg gcaatggttt ggcttatgaa gactttagtt tccccatctt 540
tcttcttgaa gatgaaaatg aaaccaaagt catcaagcag tgctatcaag atcacaacct 600
```

```
gagtcagaat ggctcagcac caaccttccc actatgtgcc atgcagctct tttcacacat 660
gcatgctgtc atcagcactg ccacctgcat gcggcgcagc tccatccaaa gcaccttcag 720
catcaaccca gaaatcgtct gtgaccccct gtctgattac aatgtgtgga gcatgctaaa 780
gcctataaat acaactggga cattaaagcc tgacgacagg gttgtggttg ctgccacccg 840
gctggatagt cgttcctttt tctggaatgt ggccccaggg gctgaaagcg cagtggcttc 900
ctttgtcacc cagctggctg ctgctgaagc tttgcaaaag gcacctgatg tgaccaccct 960
gccccgcaat gtcatgtttg tcttctttca aggggaaact tttgactaca ttggcagctc 1020
gaggatggtc tacgatatgg agaagggcaa gtttcccgtg cagttagaga atgttgactc 1080
atttgtggag ctgggacagg tggccttaag aacttcatta gagctttgga tgcacacaga 1140
tcctgtttct cagaaaaatg agtctgtacg gaaccaggtg gaggatctcc tggccacatt 1200
ggagaagagt ggtgctggtg tccctgctgt catcctcagg aggccaaatc agtcccagcc 1260
tctcccacca tcttccctgc agcgatttct tcgagctcga aacatctctg gcgttgttct 1320
ggctgaccac tctggtgcct tccataacaa atattaccag agtatttacg acactgctga 1380
gaacattaat gtgagctatc ccgaatggct gagccctgaa gaggacctga actttgtaac 1440
agacactgcc aaggccctgg cagatgtggc cacggtgctg ggacgtgctc tgtatgagct 1500
tgcaggagga accaacttca gcgacacagt tcaggctgat ccccaaacgg ttacccgcct 1560
gctctatggg ttcctgatta aagccaacaa ctcatggttc cagtctatcc tcaggcagga 1620
cctaaggtcc tacttgggtg acgggcctct tcaacattac atcgctgtct ccagccccac 1680
caacaccact tatgttgtac agtatgcctt ggcaaatttg actggcacag tggtcaacct 1740
cacccgagag cagtgccagg atccaagtaa agtcccaagt gaaaacaagg atctgtatga 1800
gtactcatgg gtccagggcc ctttgcattc taatgagacg gaccgactcc ccggtgtgt 1860
gcgttctact gcacgattag ccagggcctt gtctcctgcc tttgaactga gtcagtggag 1920
ctctactgaa tactctacat ggactgagag ccgctggaaa gatatccgtg cccggatatt 1980
tctcatcgcc agcaaagagc ttgagttgat caccctgaca gtgggcttcg gcatcctcat 2040
cttctccctc atcgtcacct actgcatcaa tgccaaagct gatgtccttt tcattgctcc 2100
ccgggagcca ggagctgtgt catactgagg aggaccccag cttttcttgc cagctcagca 2160
gttcacttcc tagagcatct gtcccactgg gacacaacca ctaatttgtc actggaacct 2220
ccctgggcct gtctcagatt gggattaaca taaaagagtg gaactatcca aaagagacag 2280
ggagaaataa ataaattgcc tcccttcctc cgctcccctt tcccatcacc ccttccccat 2340
ttcctcttcc ttctctactc atgccagatt ttgggattac aaatagaagc ttcttgctcc 2400
tgtttaactc cctagttacc caccctaatt gcccttcag gaccttcta ctttttcctt 2460
cctgccctgt acctctctct gctcctcacc cccaccctg tacccagcca ccttcctgac 2520
tgggaaggac ataaaaggtt taatgtcagg gtcaaactac attgagcccc tgaggacagg 2580
ggcatctctg ggctgagcct actgtctcct tcccactgtc ctttctccag gccctcagat 2640
ggcacattag ggtgggcgtg ctgcgggtgg gtatcccacc tccagcccac agtgctcagt 2700
tgtacttttt attaagctgt aatatctatt tttgtttttg tcttttttcct ttattctttt 2760
tgtaaatata tatataatga gtttcattaa aatagattat cccac               2805
```

<210> 65
<211> 737
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI816034

<220>
<221> unsure
<222> (1)..(737)
<223> n = a or c or g or t

<400> 65
```
tttttttttt tagtcttatc atttactttc cccaccccac attcttggaa cagcctttag 60
ttctacagga aatggcactg atggacagaa gactagcatt accttcatga aagggctgtt 120
agagctgcct gggaagaagg cgtgccttgg ggaactggga agatgccgtc agtgtgggtg 180
ggcaggagga cagccagtcg tcctgctgcc agcccaatag cttccagcgg caggtgccca 240
ggtgctaccg gagcccctca taggggtagg ggcagggact gcacctcctc caggcactca 300
tcgtaagcct cctggtactc ctcatggggc ttgaccatta tcacacaggt ggggcgcttg 360
gagcctgcgg ctgcacccag gtccgtctta gaggggatat agacataggg caaatttcgg 420
tcctcacaca tgactgggag atggcagtat acctcaatgg gcagtgtgtc tcctgccaaa 480
accatgatcc cttttttctcc tttgttgaca aatttctgaa cctctttcac cccgcgccga 540
```

92

```
atctgcttct gcttcaccgc tttcttgatg catttgtaga gctttcgcgt gaggcggcga 600
gaagcccagg gctgcgccga tgggttctgg ttgacagcag cttcctgtag gtgcgcttcc 660
ccgaacacgc ctncgcctga gcctngggcc cccgtcgatc tggcctttaa tttgtcatcg 720
cagcggccgc tgaaacc                                                737
```

<210> 66
<211> 505
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI634570

<400> 66
```
ttttttttaat tttgtaaaaa atggtttatc aattccattt ttgtataaaa cacacgggag 60
aaacctagcc aatcaacaca caactgtcac cacatgaaaa ggtactttta tcaaacttcg 120
agtctaagaa catacaaatg tttctttttat catgtctaca gtaattgtct atgctttttcc 180
atttaactgt tgttaaaaat tccacatatc cccattattt cttctgtccc agttacagta 240
caatgacggg gaggaagagg gttggttaaa gcatccctct aagcagtttt ctgctgtccc 300
ttctttccaa tcagagattt gtggatgtga gggatcacac ctctgcagtg aggtactcca 360
gaatcgcagc actgtacacg gcagcagtgg cacccaccct tccatggctt gtggtgcgag 420
tcttcaagtg tctgtggatg cggcccacag gaaactgtag cccagctctc tgtgagcgag 480
atactgcctt agccttggcc tttcc                                        505
```

<210> 67
<211> 805
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI023344

<220>
<221> unsure
<222> (1)..(805)
<223> n = a or c or g or t

<400> 67
```
ttcattaaag tccatggatc atcacaaaaa cccaggaaat gcaactaagg agaaaacaaa 60
cgtccaacca agatctaaga acccagagct atggaggaga cgttgcactg gactgctggg 120
tgtgcacaag ggggcaggag gggcgatccc catggggcat ggccactggc catgggaaac 180
acaggaggga ggccaggcag ctggctgggc ggttatgtta accgctgcac gatgacagca 240
ttgagcaggt tggcttcctt cagggtctgg ctctcatcag ccagctcttt gttcggggaaa 300
gtagtcatga ggataaagct ggtggcagcc atggctggcc gggcatccac gatgaagagt 360
cggatgtcgc tgatcctgtg gctgtggtta aatttctgca ccagcctccc gccgtctgca 420
agccgaattt ggatgtttgt ggtaggctct gattcgtcga ttaagatgga agagctggct 480
ttggcttcat tttctgcctg ttgggctgga gagctggtac tcaacacctg gggggcagtg 540
ctgcccagtt tctgaccctc gccagtgaag gctttgaagg ctcctttggg cttcacaaag 600
tcctcgtccc gatggtcctc catatccaag ttcacctgtc caccgtgagc tagcctccga 660
agctctgctg gcacctcccc tctgcggata gactccagaa actgggcatt ggatgggnct 720
tgtagcttct gaggtctcca ttatcccagc tggatccact cttccaaagg ttcatactac 780
atgaaccatc ttgcttgaaa tgctg                                        805
```

<210> 68
<211> 1529
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. Z14000

<400> 68

```
ggctgctgtt tctaaaaccc ctttccctct aacccacacc acctttctac tcactgatgc 60
cttcaggaag ccataatgga tggcacagag attgctgttt cccctcggtc actgcattca 120
gaactcatgt gccctatctg cctggacatg ctgaagaata cgatgaccac caaggagtgc 180
ctccacagat tctgctctga ctgcattgtc acagccctac ggagcgggaa caaggagtgt 240
cctacctgcc gaaagaagct ggtgtccaag cgatccctac ggccagaccc caactttgat 300
gccctgatct ctaagatcta tcctagccgg gaggaatacg aggcccatca agaccgagtg 360
cttatccgcc tgagccgcct gcacaaccag caggcattga gctccagcat tgaggagggg 420
ctacgcatgc aggccatgca cagggcccag cgtgtgaggc ggccgatacc agggtcagat 480
cagaccacaa cgatgagtgg ggggaagga gagcccgggg agggagaagg ggatggagaa 540
gatgtgagct cagactccgc ccctgactct gccccaggcc ctgctcccaa gcgaccccgt 600
ggaggggcg caggggggag cagtgtaggg acggggggag cggcactgg tggggtgggt 660
ggggtgccg gttcggaaga ctctggtgac cggggaggga ctctgggagg gggaacgctg 720
ggccccccaa gccctcctgg gcccccagc cccccagagc caggtggaga aattgagctc 780
gtgttccggc cccacccct gctcgtggag aagggagaat actgccagac gaggtatgtg 840
aagacaactg ggaatgccac agtggaccac ctctccaagt acttggccct gcgcattgcc 900
ctcgagcgga ggcaacagca ggaagcaggg gagccaggag ggcctggagg gggcgcctct 960
gacaccggag gacctgatgg gtgtggcggg gagggtgggg gtgccggagg aggtgacggt 1020
cctgaggagc ctgctttgcc cagcctggag ggcgtcagtg aaaagcagta caccatctac 1080
atcgcacctg gaggcggggc gttcacgacg ttgaatggct cgctgaccct ggagctggtg 1140
aatgagaaat tctggaaggt gtcccggcca ctggagctgt gctatgctcc caccaaggat 1200
ccaaagtgac cccaccaggg gacagccaga ggaaggggac catggggtat ccctgtgtcc 1260
tggtctatca ccccagcttc tttgtccccc agtaccccca gcccagccag ccaataagag 1320
gacacaaatg aggacacgtg gcttttatac aaagtatcta tatgagattc ttctatattg 1380
tacagagtgg ggcaaaacac gcccccatct gctgcctttt ccattgccct gcaacgtccc 1440
atctatacga ggtgttggag aaggtgaaga accctcccat tcacgcccgc ctaccaacaa 1500
caaacgtgct ttttttcctct ttgaaaaaa                                    1529
```

<210> 69
<211> 549
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AA632300

<400> 69

```
tagaaaacaa aaatggaaca tttattcgca actcaaatac tacgcatata cggtaagaga 60
ttaaatataa acacagcaag ttccacccca gtcctatttg tccaaggctg catggtcaaa 120
tggaatcttg aagagaacac ctggacaaca gaggacctgt cagcgacgtc tccggtctgg 180
acttctgctg cgtcttcggc cacctctcct cttgcctttt ggtggacccc gaacaaaaca 240
ccagtcaacg ctgatgggct gtcccatcaa atcctggcca ttgagtccct ccatagcagc 300
ctgggcttcc ttgtatgttt catattcaac tagagtatac cccttcagat atcctgttcg 360
cctgtcgaag ttgagatgaa tgttttttaat ttccccatag tctgcgaatt tgtcgtgtat 420
gtcttcttcg gtggcttcct catggactcc agttacaaag agaatccagc cttcaacaga 480
gcgttgtggt ccgggttcat cgccatcctg ctccacgctg tcataatcct cacgcatccg 540
cgctcggga                                                          549
```

<210> 70
<211> 460
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI798743

<400> 70

```
gagaatccag ctttgatctt tattcaagag accagatggg tgggcgcagg atccggctgc 60
cagccctgag gccaagcacg gctggagacc cacgacctgg cctgccgttg ccctgagctg 120
cagcctcggc cccaggatcc tgctcacagt caccgcaggt gcaggcagga agcagccctg 180
ggggactgga cgctgctatt gattcattaa aaaaagaaaa gaaaaataca cccaggcctc 240
```

```
aagtttcccc gtaacagtag ggcctgaggg gtcggcggtc ttgaggatct ggaaagagca 300
catgagggtc tcgtccacac tcatcatggc gccagcattg tcaaactcgc cacagtagtt 360
gggagctgag aaaagtgtca ccagctgccg cttggcaaag aactcgtagc cgtcttctac 420
cacctggtgt gctcggcaga tgaggtccaa gtcgtgcttg                        460
```

<210> 71
<211> 635
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. H98166

<220>
<221> unsure
<222> (1)..(626)
<223> n = a or c or g or t

<400> 71
```
cctaaagcaa gtaactttat tatcattcct ttaaaaagaa ccaaggaaaa ttcacaacat 60
atgtgaaaca caaacagctg tggtttagga ggtaaacaaa ggaccaacat agccctgaaa 120
tgcaacagcc tctgagtgac ttgagccgca tgtgactggg gttctgttaa aagggcaggc 180
ncctccctcc tagccctgaa gccccaggaa cctgccttga aagacaagct ctctaatact 240
caacttgcag ggtctcgccc taacatccaa gacttggtag catctccttt ctcccaaaac 300
ccagctggaa ctcaactaat cctaaaccga aaactcaaga acagcacacc agatgccacc 360
tgttgtttgt cagggtcttc aaacttccag aggaaatggc atttgcctgt catggttttc 420
ctctctaagg gcacctgtct gaacttggag ctgtgcttcc actggtgcct catggggcct 480
ggggctactc tccacctgaa ttcacacttt tcnctataag ggatcaggtg gggaataagt 540
ccagaaggtg acaagagggt cccgggcaaa gagcttgnca ttcctggnag ggatttccca 600
aatggccccg anggttggcg aggcgggaag naaaa                            635
```

<210> 72
<211> 534
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AA039699

<220>
<221> unsure
<222> (1)..(534)
<223> n = a or c or g or t

<400> 72
```
ggtgagggcg ggcggagatg tagacccggt agtgttgtgc cttgtggtga caactggcgg 60
cacgcgccgg ggcccgagac ttagtctcgc acnantnggc caagcagtcc acgagagcct 120
ctacttcaat cccatgatgn nccaatgggg ttgtgcacgc caatgtgttc ggcatcaagg 180
actgggtgac ngccgtacaa gatcgcggtg ctggtgctgc tgaacgagat gagccgcaca 240
ggcaagnggc gccgtccagc ctcatggang cggcggagnc tcaaccagct gctcctgccc 300
ctgcttgcag ggcccaggat attacacttg tcaaaacttt acaagttaat tgaagagtct 360
tgtccacagc ttggcaaatt cagtgcagat cagaatcaaa cttgatggct tgaaagcgag 420
tttgaangat attggaacag ttttttttgat gacctttcag attctttctc tggaactgaa 480
ccagaagttt cacaaaacaa gtgtagtaag gttgttttct gcgtcaaatg atct        534
```

<210> 73
<211> 981
<212> DNA
<213> Homo sapiens

<220>

<223> Genbank Accession No. D78132

<400> 73
```
ctgaggaggc cgccaagatg ccgcagtcca agtcccggaa gatcgcgatc ctgggctacc 60
ggtctgtggg gaaatcctca ttgacgattc aatttgttga aggccaattt gtggactcct 120
acgatccaac catagaaaac actttacaa agttgatcac agtaaatgga caagaatatc 180
atcttcaact tgtagacaca gccgggcaag atgaatattc tatctttcct cagacatact 240
ccatagatat taatggctat attcttgtgt attctgttac atcaatcaaa agttttgaag 300
tgattaaagt tatccatggc aaattgttgg atatggtggg gaaagtacaa ataccattta 360
tgttggtttg gaataagaaa gacctgcata tggaaagggt gatcagttat gaagaaggga 420
aagctttggc agaatcttgg aatgcagctt ttttggaatc ttctgctaaa gaaaatcaga 480
ctgctgtgga tgttttctga aggataattt tggaggcaga aaaaatggac ggggcagctt 540
cacaaggcaa gtcttcatgc tcggtgatgt gattctgctg caaagcctga ggacactggg 600
aatatattct acctgaagaa gcaaactgcc cgttctcctt gaagataaac tatgcttctt 660
ttttcttctg ttaacctgaa agatatcatt tgggtcagag ctcccctccc ttcagattat 720
gttaactctg agtctgtcca aatgagttca cttccatttt caaattttaa gcaatcatat 780
tttcaattta tatattgtat ttcttaatat tatgaccaag aattttatcg gcattaattt 840
ttcagtgtag tttgttgttt aaaataatgt aatcatcaaa atgatgcata ttgttacact 900
actattaact aggcttcagt atatcagtgt ttatttcatt gtgttaaatg tatacttgta 960
aataaaatag ctgcaaacct c                                          981
```

<210> 74
<211> 2263
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. U03985

<400> 74
```
gagccggacg tgtgcgcgaa gatggcgggc cggagcatgc aagcggcaag atgtcctaca 60
gatgaattat ctttaaccaa ttgttcagtt gtgaatgaaa aggatttcca gtctggccag 120
catgtgattg tgaggacctc tcccaatcac aggtacacat ttacactgaa gacacatcca 180
tcggtggttc cagggagcat tgcattcagt ttacctcaga gaaatgggc tgggctttct 240
attgggcaag aaatagaagt ctccttatat acatttgaca aagccaaaca gtgtattggc 300
acaatgacca tcgagattga tttcctgcag aaaaaaagca atgactccaa cccttatgac 360
accgacaaga tggcagcaga atttattcag caattcaaca accaggccta ctcagtggga 420
caacagcttg tctttagctt caatgaaaag cttttttggct tactggtgaa ggacattgaa 480
tccatggatc ctagcatcct gaagggagag cctgcgacag ggaaaaggca aagattgaa 540
gtaggactgg ttgttggaaa cagtcaagtt gcatttgaaa aagcagaaaa ttcgtcactt 600
aatcttattg gcaaagctaa aaccaaggaa aatcgccaat caattatcaa tcctgactgg 660
aactttgaaa aaatgggaat aggaggtcta gacaaggaat tttcagatat tttccgacga 720
gcatttgcct tccgagtatt tcctccagag attgtggagc agatgggttg tatacatgtt 780
aaaggcatcc tgttatatgg accccaggt tgtggtaaga ctctcttggc tcgacagatt 840
ggcaagatgt tgaatgcaag agagcccaaa gtggtcaatg ggccagaaat ccttaacaaa 900
tatgtgggag aatcagaggc taacattcgc aaacttttttg ctgatgctga agaggagcaa 960
aggaggcttg gtgctaacag tggtttgcac atcatcatct ttgatgaaat tgatgccatc 1020
tgcaagcaga gagggagcat ggctggtagc acgggagttc atgacactgt tgtcaaccag 1080
ttgctgtcca aaattgatgg cgtggagcag ctaaacaaca tcctagtcat tggaatgacc 1140
aatagaccag atctgataga tgaggctctt cttagacctg gaagactgga agttaaaatg 1200
gagatagggct tgccagatga gaaaggccga ctacagattc ttcacatcca cacagcaaga 1260
atgagagggc atcagttact ctctgctgat gtagacatta agaactggc cgtggagacc 1320
aagaatttca gtggtgctga attggagggt ctggtgcgag cagcccagtc cactgctatg 1380
aatagacaca taaaggccag tactaaagtg gaagtgggaca tggagaaagc agaaagcctg 1440
caagtgacga gaggagactt ccttgcttct ttggagaatg atatcaaacc agcctttggc 1500
acaaaccaag aagattatgc aagttagctg ctggtgcagc agactaagaa cagtgaccgc 1620
acaccattgg tcagcgtgct tctggaaggc cctcctcaca gtgggaagac tgctttagct 1680
gcaaaaattg cagaggaatc caacttcccg ttcatcaaga tctgttctcc tgataaaatg 1740
attggctttt ctgaaacagc caaatgtcag gccatgaaga agatctttga tgatgcgtac 1800
aaatcccagc tcagttgtgt ggttgtggat gacattgaga gattgcttga ttacgtccct 1860
```

```
attggccctc gattttcaaa tcttgtatta caggctcttc tcgttttact gaaaaaggca 1920
cctcctcagg gccgcaagct tcttatcatt gggaccacta gccgcaaaga tgtccttcag 1980
gagatggaaa tgcttaacgc tttcagcacc accatccacg tgcccaacat tgccacagga 2040
gagcagctgt tggaagcttt ggagcttttg ggcaacttaa aggataagga acgcaccaca 2100
attgcacagc aagtcaaagg gaagaaggtc tggataggaa tcaagaagtt actaatgctg 2160
atcgagatgt ccctacagat ggatcctgaa taccgtgtga gaaaattctt ggccctctta 2220
agagaagaag gagctagccc ccttgatttt gattgaaaat gaa                    2263
```

<210> 75
<211> 1476
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. U16799

<400> 75
```
gccacccacc ctccggaccg cggcagctgc tgacccgcca tcgccatggc ccgcgggaaa 60
gccaaggagg agggcagctg gaagaaattc atctggaact cagagaagaa ggagtttctg 120
ggcaggaccg gtggcagttg gtttaagatc cttctattct acgtaatatt ttatggctgc 180
ctggctggca tcttcatcgg aaccatccaa gtgatgctgc tcaccatcag tgaatttaag 240
cccacatatc aggaccgagt ggccccgcca ggattaacac agattcctca gatccagaag 300
actgaaattt cctttcgtcc taatgatccc aagagctatg aggcatatgt actgaacata 360
gttaggttcc tggaaaagta caaagattca gcccagaggg atgacatgat tttttgaagat 420
tgtggcgatg tgcccagtga accgaaagaa cgaggagact ttaatcatga acgaggagag 480
cgaaaggtct gcagattcaa gcttgaatgg ctgggaaatt gctctggatt aaatgatgaa 540
acttatggct acaaagaggg caaaccgtgc attattataa agctcaaccg agttctaggc 600
ttcaaaccta gcctcccaa gaatgagtcc ttggagactt acccagtgat gaagtataac 660
ccaaatgtcc ttcccgttca gtgcactggc aagcgagatg aagataagga taaagttgga 720
aatgtggagt attttggact gggcaactcc cctggttttc ctctgcagta ttatccgtac 780
tatggcaaac tcctgcagcc caaatacctg cagcccctgc tggccgtaca gttcaccaat 840
cttaccatgg acactgaaat tcgcatagag tgtaaggcgt acggtgagaa cattgggtac 900
agtgagaaag accgttttca gggacgtttt gatgtaaaaa ttaaatttta agtgacacta 960
cagaaaaaca caaaaaggtg atgggttgtg ttatgcttgt attgaatgct gtcttgacat 1020
ctcttgcctt gtcctccggt atgttctaaa gctgtgtctg agatctggat ctgcccatca 1080
ctttggctag tgacagggct aattaatttg ctttatacat tttctttttac tttccttttt 1140
tcctttctgg aggcatcaca tgctggtgct gtgtctttat gaatgtttta accattttca 1200
tggtggaaga attttatatt tatgcagttg tacaatttta tttttttctg caagaaaaag 1260
tgtaatgtat gaaataaacc aaagtcactt gtttgaaaat aaatctttat tttgaacttt 1320
ataaaaagca atgcagtacc ccatagactg gtgttaaatg ttgtctacag tgcaaaatcc 1380
atgttctaac atatgtaata attgccagga gtacagtgct cttgttgatc ttgtattcag 1440
tcaggttaaa acaacggtca ataaaagaat gaacac                           1476
```

<210> 76
<211> 825
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI354351

<400> 76
```
tgaagttcat catctttaga cttaaggaat taacaagggt cagggagact acaccaggct 60
gagggcttct tggttcctgg agacatgccc agctacagca aacacaggga aacacgaagg 120
gggcagctgg aagatttggt cttgaacttg ggggtgggt aagtgatgat ccccacgact 180
ggagcagcag gaagaagttg tgtctgagga agtgctgggc cgcccagagg gacagccctg 240
ccctggagct tgtcgccggg agggaaggga aacaagcccc ctccctcagt gctgaggaaa 300
aggcacttgg cctgggtctc ctcctgccct ctccccatcc gtgggagaga cggggtcctt 360
gcctccttgc ccctttcagc cgcccagaag ccggtcctgg ttcagcctct ggaagaagct 420
tttgccgaac tcataggtgc tgatcatgat ggcacaggag ggggcagcct tgatgatccg 480
aggaaggaag cctgcaaaga gtcccttgtt gcccgactcg gaccggatcc ttcgcagcag 540
```

```
cagccaggtg gagtccacat gccaggagtt cactttttcca gcctccatcg ctccccagac 600
gacctggccg ttggtcttta ccacgtcaaa gggtagaagt aagaactgcg cccaccgccc 660
tgagatgcca ccagcccaca aagctcaggc ccacagaagt cttgttctttt cggctgagcc 720
cattgaccca gtttttcacc agctctaggt taacccagaa cgggcttgaa aagccacatt 780
tccgaaggcc agtggggcct agcccagcca cagggaacgc cagcc          825
```

<210> 77
<211> 692
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. D26598

<400> 77
```
cctagtacac cgcaatcatg tctattatgt cctataacgg aggggccgtc atggccatga 60
aggggaagaa ctgtgtggcc atcgctgcag acaggcgctt cgggatccag gcccagttgg 120
tgaccacgga cttccagaag atctttccca tgggtgaccg gctgtacatc ggtctggccg 180
ggctcgccac tgacgtccag acagttgccc agcgcctcaa gttccggctg aacctgtatg 240
agttgaagga aggtcggcag atcaaacctt ataccctcat gagcatggtg gccaacctct 300
tgtatgagaa acggtttggc ccttactaca ctgagccagt cattgccggg ttggacccga 360
agacctttaa gcccttcatt tgctctctag acctcatcgg ctgccccatg gtgactgatg 420
actttgtggt cagtggcacc tgcgccgaac aaatgtacgg aatgtgtgag tccctctggg 480
agcccaacat ggatccggat cacctgtttg aaaccatctc ccaagccatg ctgaatgctg 540
tggaccggga tgcagtgtca ggcatgggag tcattgtcca catcatcgag aaggacaaaa 600
tcaccaccag gacactgaag gcccgaatgg actaaccctg ttcccagagc ccactttttt 660
ttcttttttt gaaataaaat agcctgtctt tc                       692
```

<210> 78
<211> 1059
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. X95404

<400> 78
```
gctctcgtct tctgcggctc tcggtgccct ctccttttcg tttccggaaa catggcctcc 60
ggtgtggctg tctctgatgg tgtcatcaag gtgttcaacg acatgaaggt gcgtaagtct 120
tcaacgccag aggaggtgaa gaagcgcaag aaggcggtgc tcttctgcct gagtgaggac 180
aagaagaaca tcatcctgga ggagggtgaag gagatcctgg tgggcgatgt gggccagact 240
gtcgacgatc cctacgccac ctttgtcaag atgctgccag ataaggactg ccgctatgcc 300
ctctatgatg caacctatga gaccaaggag agcaagaagg aggatctggt gtttatcttc 360
tgggcccccg agtctgcgcc ccttaagagc aaaatgattt atgccagctc caaggacgcc 420
atcaagaaga agctgacagg gatcaagcat gaattgcaag caaactgcta cgaggaggtc 480
aaggaccgct gcaccctggc agagaagctg ggggggcagtg cggtcatctc cctggagggc 540
aagcctttgt gagccccttc tggccccctg cctggagcat ctggcagccc cacacctgcc 600
cttggggggtt gcaggctgcc cccttcctgc cagaccggag gggctggggg gatcccagca 660
ggggggaggca atcccttcac cccagttgcc aaacagaccc cccacccccct ggatttttcct 720
tctccctcca tccttgacg gttctggcct tcccaaactg cttttgatct tttgattcct 780
cttgggctga agcagaccaa gttccccccca ggcaccccag ttgtggggga gcctgtattt 840
ttttttaacaa catccccatt ccccacctgg tcctccccct tcccatgctg ccaacttcta 900
accgcaatag tgactctgtg cttgtctgtt tagttctgtg tataaatgga atgttgtgga 960
gatgacccct ccctgtgccg gctggttcct ctcctttttc ccctggtcac ggctactcat 1020
ggaagcagga ccagtaaggg accttcgatt aaaaaaaaa                 1059
```

<210> 79
<211> 3309
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. M15036

<400> 79
```
ctgcagggg gggggggggg gggggggggg ggggggggcg cagcacggct cagaccgagg 60
cgcacaggct cgcagctccg ggcgcctagc gcccggtccc cgccgcgacg cgccaccgtc 120
cctgccggcg cctccgcgcc ttcgaaatga gggtcctggg tgggcgctgc ggggcgccgc 180
tggcgtgtct cctcctagtg cttcccgtct cagaggcaaa ccttctgtca aagcaacagg 240
cttcacaagt cctggttagg aagcgtcgtg caaattcttt acttgaagaa accaaacagg 300
gtaatcttga aagagaatgc atcgaagaac tgtgcaataa agaagaagcc agggaggtct 360
ttgaaaatga cccggaaacg gattattttt atccaaaata cttagtttgt cttcgctctt 420
ttcaaactgg gttattcact gctgcacgtc agtcaactaa tgcttatcct gacctaagaa 480
gctgtgtcaa tgccattcca gaccagtgta gtcctctgcc atgcaatgaa gatggatata 540
tgagctgcaa agatggaaaa gcttctttta cttgcacttg taaaccaggt tggcaaggag 600
aaaagtgtga atttgacata aatgaatgca aagatccctc aaatataaat ggaggttgca 660
gtcaaatttg tgataataca cctggaagtt accactgttc ctgtaaaaat ggttttgtta 720
tgctttcaaa taagaaagat tgtaaagatg tggatgaatg ctctttgaag ccaagcattt 780
gtggcacagc tgtgtgcaag aacatcccag gagattttga atgtgaatgc cccgaaggct 840
acagatataa tctcaaatca aagtcttgtg aagatataga tgaatgctct gagaacatgt 900
gtgctcagct ttgtgtcaat taccctggag gttacacttg ctattgtgat gggaagaaag 960
gattcaaact gcccaagat cagaagagtt gtgaggttgt ttcagtgtgc cttcccttga 1020
accttgacac aaagtatgaa ttactttact tggcggagca gtttgcaggg gttgttttat 1080
atttaaaatt tcgtttgcca gaaatcagca gattttcagc agaatttgat ttccggacat 1140
atgattcaga aggcgtgata ctgtacgcag aatctatcga tcactcagcg tggctcctga 1200
ttgcacttcg tggtggaaag attgaagttc agcttaagaa tgaacataca tccaaaatca 1260
caactggagg tgatgttatt aataatggtc tatggaatat ggtgtctgtg aagaattag 1320
aacatagtat tagcattaaa atagctaaag aagctgtgat ggatataaat aaacctggac 1380
cccttttaa gccggaaaat ggattgctgg aaaccaaagt atactttgca ggattccctc 1440
ggaaagtgga aagtgaactc attaaaccga ttaaccctcg tctagatgga tgtatacgaa 1500
gctggaattt gatgaagcaa ggagcttctg aataaagga aattattcaa gaaaaacaaa 1560
ataagcattg cctggttact gtggagaagg gctcctacta tcctggttct ggaattgctc 1620
aatttcacat agattataat aatgtatcca gtgctgaggg ttggcatgta aatgtgacct 1680
tgaatattcg tccatccacg ggcactggtg ttatgcttgc cttggtttct ggtaacaaca 1740
cagtgccctt tgctgtgtcc ttggtggact ccacctctga aaaatcacag gatattctgt 1800
tatctgttga aaatactgta atatatcgga tacaggccct aagtctatgt tccgatcaac 1860
aatctcatct ggaatttaga gtcaacagaa acaatctgga gttgtcgaca ccacttaaaa 1920
tagaaaccat ctcccatgaa gaccttcaaa gacaacttgc cgtcttggac aaagcaatga 1980
aagcaaaagt ggccacatac ctgggtggcc ttccagatgt tccattcagt gccacaccag 2040
tgaatgcctt ttataatggc tgcatggaag tgaatattaa tggtgtacag ttggatctgg 2100
atgaagccat ttctaaacat aatgatatta gagctcactc atgtccatca gtttggaaaa 2160
agacaaagaa ttcttaaggc atctttttctc tgcttataat accttttcct tgtgtgtaat 2220
tatacttatg tttcaataac agctgaaggg ttttatttac aatgtgcagt ctttgattat 2280
tttgtggtcc tttctgggga tttttaaaag gtcctttgtc aaggaaaaaa attctgttgt 2340
gatataaatc acagtaaaga aattcttact tctcttgcta tctaagaata gtgaaaaata 2400
acaattttaa atttgaattt ttttcctaca aatgacagtt tcaattttg tttgtaaaac 2460
taaattttaa ttttatcatc atgaactagt gtctaaatac ctatgttttt ttcagaaagc 2520
aaggaagtaa actcaaacaa aagtgcgtgt aattaaatac tattaatcat aggcagatac 2580
tattttgttt atgttttttgt tttttcctg atgaaggcag aagagatggt ggtctattaa 2640
atatgaattg aatggagggt cctaatgcct tatttcaaaa caattcctca gggggaccag 2700
ctttggcttc atctttctct tgtgtggctt cacatttaaa ccagtatctt tattgaatta 2760
gaaaacaagt gggacatatt ttcctgagag cagcacagga atcttcttct tggcagctgc 2820
agtctgtcag gatgagatat cagattaggt tggataggtg gggaaatctg aagtgggtac 2880
attttttaaa ttttgctgtg tgggtcacac aaggtctaca ttacaaaaga cagaattcag 2940
ggatggaaag gagaatgaac aaatgtggga gttcatagtt ttccttgaat ccaactttta 3000
attaccagag taagttgcca aaatgtgatt gttgaagtac aaaaggaact atgaaaacca 3060
gaacaaattt taacaaaagg acaaccacag agggatatag tgaatatcgt atcattgtaa 3120
tcaaagaagt aaggaggtaa gattgccacg tgcctgctgg tactgtgatg catttcaagt 3180
ggcagtttta tcacgtttga atctaccatt catagccaga tgtgtatcag atgtttcact 3240
gacagttttt aacaataaat tcttttcact gtattttata tcacttataa taaatcggtg 3300
tataattt                                                      3309
```

<210> 80
<211> 604
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AA219354

<220>
<221> unsure
<222> (1)..(604)
<223> n = a or c or g or t

<400> 80
```
gaatacaatg atgtatttct ttattttcac atacactcta gctaaaagag caagagtaca 60
catcaacaaa aatggaaaca aggctttggc tgaaaaaaac atgcatttga caaatcatgt 120
taatagctag acaagaagaa agttagcttt gtaaacttct acttcatttg attcagagaa 180
acagagcatg agttttctta aaagtaacaa gaaaaggaac aaaaaaaatg aggtttgaaa 240
tcttttacca tggcaaaaca ttaacatctt tctcaaaaac atagagaaat ctggaaaaat 300
caagaagata aaattctgga ccagttagtg acattctttc aagcatactt gtaaaatgtt 360
tccttaaagt gttcttggga tgaaaatgat tgtcatgtct ccaacaacag tgaactgatg 420
ttgttccttg gaataaaagt caatccccac cttaaaaaat gtatggcttc tttgaggaat 480
tcttatggct taaagacttt ttacattcta gaccattaaa ttgattgagg nctaaattaa 540
gaagtgaata gttacnctac acggtaaggt agcagcctga agcattggna ccaanagggt 600
gtgg                                                             604
```

<210> 81
<211> 1550
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. M16447

<400> 81
```
gtggcctacc atggtttcaa cgggtaacgg ggaataaggg ttcgattcgg agctgcggga 60
gccgggctgg caggagcagg atggcggcgg cggcggctgc aggcgaggcg cgccgggtgc 120
tggtgtacgg cggcaggggc gctctgggtt ctcgatgcgt gcaggctttt cgggcccgca 180
actggtgggt tgccagcgtt gatgtggtgg agaatgaaga ggccagcgct acgatcattg 240
ttaaaatgac agactcgttc actgagcagg ctgaccaggt gactgctgag gttggaaagc 300
tcttgggtga agagaaggtg gatgcaattc tttgcgttgc tggaggatgg gccggggggca 360
atgccaaatc caagtctctc tttaagaact gtgacctgat gtggaagcag agcatatgga 420
catcgaccat ctccagccat ctggctacca agcatctcaa ggaaggaggc ctcctgacct 480
tggctggcgc aaaggctgcc ctggatggga ctcctggtat gatcgggtac ggcatggcca 540
agggtgctgt tcaccagctc tgccagagcc tggctgggaa gaacagcggc atgccgcccg 600
gggcagccgc catcgctgtg ctcccggtta ccctggatac cccgatgaac aggaaatcaa 660
tgcctgaggc tgacttcagc tcctggacac ccttagaatt cctagttgaa actttccatg 720
actggatcac agggaaaaac cgaccgagct caggaagcct aatccaggtg gtaaccacag 780
aaggaaggac ggaactcacc ccagcatatt tttaggcctc atctcagtgc ctatgagggg 840
cctgccagaa aagtcactaa cctgtctcag tgtggccttg tccagccttg tgtttctgt 900
aaccCctgtt tgtggtacga gataatgagt cctatttttc tctcacataa tatgcatttg 960
ctctcctagg gacaagtgta atacatttat gtgaagtaag acaatgcgag actggtggcc 1020
gtcaaatagc atccgtcaat ctgtgttaac tgcataggag gctctcgata gcacctgcta 1080
tagcggtgtc atgttggatc gctttgtgac tgttcatctg tccttgacag tggctgtcat 1140
cttgactact ttgttgattt gttggtattg gggacatttt aaaggctgag ttattttga 1200
atgtcatgtt tatgtcatag acgtagaaaa cgcatccttg aattaaactg ccttaactcc 1260
ttttgtggta taagcaaact acatggactc tgtccctggt atccttttcc tgtgtggttg 1320
ccCctgtgcc tgtggtctgg cctaggttaa gtgtgcaaga taactactcg tgagttattc 1380
agaatgttgt tcctaataaa tgcacttgtt gtctgtcttc tttaatcaaa tcacatctta 1440
tatacagcag tcagagatga gtatactaga atcatggatt gctggaggtc ttttaatctg 1500
atgttctcag aaggggggtgg atttaaatcc tgaaataaat atttcaacac          1550
```

<210> 82
<211> 3634
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. D10040

<400> 82
```
tcaacacagg acaatgcaag cccatgagct gttccggtat tttcgaatgc cagagctggt 60
tgacttccga cagtacgtgc gtactcttcc gaccaacacg cttatgggct tcggagcttt 120
tgcagcactc accaccttct ggtacgccac gagacccaaa cccctgaagc cgccatgcga 180
cctctccatg cagtcagtgg aagtggcggg tagtggtggt gcacgaagat ccgcactact 240
tgacagcgac gagcccttgg tgtatttcta tgatgatgtc acaacattat acgaaggttt 300
ccagagggga atacaggtgt caaataatgg cccttgttta ggctctcgga aaccagacca 360
accctatgaa tggctttcat ataaacaggt tgcagaattg tcggagtgca taggctcagc 420
actgatccag aagggcttca agactgcccc agatcagttc attggcatct ttgctcaaaa 480
tagacctgag tgggtgatta ttgaacaagg atgctttgct tattcgatgg tgatcgttcc 540
actttatgat acccttggaa atgaagccat cacgtacata gtcaacaaag ctgaactctc 600
tctggttttt gttgacaagc cagagaaggc caaactctta ttagagggtg tagaaaataa 660
gttaatacca ggccttaaaa tcatagttgt catggatgcc tacggcagtg aactggtgga 720
acgaggccag aggtgtgggg tggaagtcac cagcatgaag gcgatggagg acctgggaag 780
agccaacaga cggaagccca agcctccagc acctgaagat cttgcagtaa tttgtttcac 840
aagtggaact acaggcaacc ccaaaggagc aatggtcact caccgaaaca tagtgagcga 900
ttgttcagct tttgtgaaag caacagagaa tacagtcaat ccttgcccag atgatacttt 960
gatatctttc ttgcctctcg cccatatgtt tgagagagtt gtagagtgtg taatgctgtg 1020
tcatggagct aaaatcggat ttttccaagg.agatatcagg ctgctcatgg atgacctcaa 1080
ggtgcttcaa cccactgtct tccccgtggt tccaagactg ctgaaccgga tgtttgaccg 1140
aattttcgga caagcaaaca ccacgctgaa gcgatggctc ttggactttg cctccaagag 1200
gaaagaagca gagcttcgca gcggcatcat cagaaacaac agcctgtggg accggctgat 1260
cttccacaaa gtacagtcga gcctgggcgg aagagtccgg ctgatggtga caggagccgc 1320
cccggtgtct gccactgtgc tgacgttcct cagagcagcc ctgggctgtc agttttatga 1380
aggatacgga cagacagagt gcactgccgg gtgctgccta accatgcctg gagactggac 1440
cgcaggccat gttgggggcc cgatgccgtg caatttgata aaacttgttg atgtggaaga 1500
aatgaattac atggctgccg agggcgaggg cgaggtgtgt gtgaaagggc caaatgtatt 1560
tcaggctac ttgaaggacc cagcgaaaac agcagaagct ttggacaaag acggctggtt 1620
acacacaggg gacattggaa aatggttacc aaatggcacc ttgaaaatta tcgaccggaa 1680
aaagcacata tttaagctgg cacaaggaga atacatagcc cctgaaaaga ttgaaaatat 1740
ctacatgcga agtgagcctg ttgctcaggt gtttgtccac ggagaaagcc tgcaggcatt 1800
tctcattgca attgtggtac cagatgttga gacattatgt tcctgggccc aaaagagagg 1860
atttgaaggg tcgtttgagg aactgtgcag aaataaggat gtcaaaaaag ctatcctcga 1920
agatatggtg agacttggga aggattctgg tctgaaacca tttgaacagg tcaaaggcat 1980
cacattgcac cctgaattat tttctatcga caatggcctt ctgactccaa caatgaaggc 2040
gaaaaggcca gagctgcgga actatttcag gtcgcagata gatgacctct attccactat 2100
caaggtttag tgtgaagaag aaagctcaga ggaaatggca cagttaggga ggaagcgttc 2160
ctgctgatgg ccttcatgtt gttaattttg aatacagcaa gtgtagggaa ggaagcgttc 2220
gtgtttgact tgtccattcg gggttcttct cataggaatg ctagaggaaa cagaacaccg 2280
ccttacagtc acctcatgtt gcagaccatg tttatggtaa tacacacttt ccaaaatgag 2340
ccttaaaaat tgtaaagggg atactataaa tgtgctaagt tatttgagac ttcctcagtt 2400
taaaaagtgg gttttaaatc ttctgtctcc ctgctttct aatcaagggg ttaggacttt 2460
gctatctctg agatgtctgc tacttgctgc aaattctgca gctgtctgct gctctaaaga 2520
gtacagtgca ctagagggaa gtgttccctt taaaaataag aacaactgtc ctggctggag 2580
aatctcacaa gcggaccaga gatctttta aatccctgct actgtccctt ctcacaggca 2640
ttcacagaac ccttctgatt cgtaagggtt acgaaactca tgttcttctc cagtcccctg 2700
tggtttctgt tggagcataa ggtttccagt aagcgggagg gcagatccaa ctcagaacca 2760
tgcagataag gagcctctgg caaatgggtg ctcatcagaa cgcgtggatt ctctttcatg 2820
gcagaatgct cttggactcg gttctccagg cctgattccc cgactccatc cttttttcagg 2880
ggttatttaa aaatctgcct tagattctat agtgaagaca agcatttcaa gaaagagtta 2940
cctggatcag ccatgctcag ctgtgacgcc tgaataactg tctactttat cttcactgaa 3000
ccactcactc tgtgtaaagg ccaacagatt tttaatgtgg ttttcatatc aaaagatcat 3060
```

```
gttgggatta acttgccttt ttccccaaaa aataaactct caggcaagca tttctttaaa 3120
gctattaagg gagtatatac ttgagtactt attgaaatgg acagtaataa gcaaatgttc 3180
ttataatgct acctgatttc tatgaaatgt gtttgacaag ccaaaattct aggatgtaga 3240
aatctggaaa gttcatttcc tgggattcac ttctccaggg attttttaaa gttaatttgg 3300
gaaattaaca gcagttcact ttattgtgag tctttgccac atttgactga attgagctgt 3360
catttgtaca tttaaagcag ctgttttggg gtctgtgaga gtacatgtat tatatacaag 3420
cacaacaggg cttgcactaa agaattgtca ttgtaataac actacttggt agcctaactt 3480
catatatgta ttcttaattg cacaaaaagt caataatttg tcaccttggg gttttgaatg 3540
tttgctttaa gtgttggcta tttctatgtt ttataaacca aaacaaaatt tccaaaaaca 3600
atgaaggaaa ccaaaataaa tatttctgca tttc                                3634
```

```
<210> 83
<211> 377
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. W42636

<400> 83
cactatgtac aaaaacattt taattgaaat acctgtataa aaaaatatga tctccagaca 60
tctcactttt gaactgaaag aacccccatc tgcgatgcct gcacacaccg cattcacaca 120
aacacaggta ctgaataaat taaacgctca ggctctggcc ccacccagc tttcagagcc 180
cacaagcaga ctgtacaaag tcaataattt aaaacccaaa ccctgggcac agtgcctgga 240
agtgtcaggg tcacccactc cccttaagtt agccactata catgttcatc ttctgacagg 300
cggggccagg acagacgcca ggcacaggga atcaggggct gggggtccct tggaccacag 360
gccaaccccc tcccctt                                                   377
```

```
<210> 84
<211> 418
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. T66157

<220>
<221> unsure
<222> (1)..(418)
<223> n = a or c or g or t

<400> 84
tttttagaaa gaaatagatt tattctcatg tacaaagcgg tcacccacgg gaccatatac 60
gacagttgca cagagtccta gaaaaacgca tctntctaaa ggcaactcag aaaggtaagg 120
caggtggacc ccctcccca ccccacaacg cacacagant gaaacggaga aaaagagaga 180
agccagtgnc ngggntgacc caagattccc ggccctatgg ggtttcccaa gccccagggc 240
acaggtggnt atggccttna agagagagcc ctgccaggtt nanggccagg tttttcattg 300
gctgcaggnt tgggtaaggg gntcaggcca aggggaacan tcaggggcc tntnagacan 360
tcaggnttgg gntctctgtg ccttaggggt ttgcagaaac attccatagc ctctgctg 418
```

```
<210> 85
<211> 1811
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. M62831

<400> 85
ggtttgtgta gagaggcgtg cagagcccgt tgtccggagt gcacctgctg cctgttctgt 60
ccctcccggg agcccccgcc gctgtcgccg tcgagtcgcc atggaagtgc agaaagaggc 120
```

```
acagcgcatc atgaccctgt cggtgtggaa gatgtatcac tcccgcatgc agcgcggtgg 180
cctgcggctg caccggagtc tgcagctgtc gctggtcatg cgcagcgccc gggagctcta 240
cctctcggcc aaggtggagg ccctcgagcc cgaggtgtcg ttgccggccg ccctcccctc 300
tgaccctcgc ctgcacccgc cccgagaagc cgagtccacg gccgagacag cgacccccga 360
cggtgagcac ccgtttccgg agccaatgga cacgcaggag gcgccgacag ccgaggagac 420
ctccgcctgc tgtgccccgc gccccgccaa agtcagccgc aaacgacgca gcagcagcct 480
gagcgacggc ggggacgttg gactggtccc gagcaagaaa gcccgtctgg aagaaaagga 540
agaagaggag ggagcgtcat ccgaagtcgc cgatcgcctg cagcccctc cgggccaagc 600
ggagggcgcc tttcccaacc tggcccgcgt cctgcagagg cgcttctccg gcctcctgaa 660
ctgcagcccc gcggcccctc cgacggcgcc gcccgcgtgc gaggcaaagc ccgcttgccg 720
cccggcggac agcatgctca acgtgctcgt gcgggccgtg gtggccttct gaggacccg 780
agcggcgctg ccggagccca gagcgcgcgt cgaaccgtcg gcccgagggc gcagacctga 840
ggcgaggcca ccccctcca tcctgggga agcgcccgcg aaaaccgtgg agagaagccg 900
ccgcccgggc tgctgagagg cccggagagg actctgtccc cggggagcca tcgccttcag 960
tgtgcaggga cggcaccgag gagtctgagc cgggcgcggg cgccttccgc agagacctgc 1020
gcccacaggt gctgtcttag tggactggga cgtgaacctt tcgctctcct tctggactgg 1080
gagaagggag gcttgggtgt tgtgtttttt gttttgtttg tttgtttgtt tttaaagatc 1140
tcctcagggt cggacttcat tttgtactgt gggctgtgct ggccctttca aggttttca 1200
agagttggtt ttgcgtttcc aacctcggag aattccaggc actcccttc ccctccgct 1260
gacatacttg tataagcggt catcgttgcg tcatggggca ggcgtgggga gcttcctgtc 1320
gccttggctg ggtgtgggcc tggaggaagg tcctggggcg tgcactcgcc tgggcagtgg 1380
ggaggagagt ggcctgagtt acttcacccc cgcgtgctgc tggttaatgt cccgcgtctc 1440
tgcaccttcg ggtgggagcg gggactgatc tactttcaca ttctcaagtt tttctcatct 1500
gcattagagg tccccagtag gttcccaggt tccagcgtgc ccctccctca gacacacgga 1560
cacaatcagc cgagaagttc ctggtctgaa tcacgagaat gtggaggggt gggggggtgtc 1620
agtggaaagg cataaggctg agctgagacc agttgctggt gaaactgggc caatctgggg 1680
aggggaacat ccttgccagg gagtttctga gggtctgctt tgtttacctt tcgtgcggtg 1740
gattcttttt aactccgtct acctggcgtt ttgttagaaa tgtcagatag gaaaataaaa 1800
accatttgag t                                                    1811
```

```
<210> 86
<211> 372
<212> DNA
<213> Homo sapiens


<220>
<223> Genbank Accession No. T98839


<220>
<221> unsure
<222> (1)..(372)
<223> n = a or c or g or t


<400> 86
gattcaaaag aatggagatg gagaagaagg ggaggggagg gaggggagag ataaacagag 60
agagacagag aattatatag cagtatgcaa aaaaccagtt taaaacctgt gaagcaaaga 120
gaaatgggtg tatgagctag acaggcatga ggagtgacag agtttcctct tcaaggagac 180
ggtatccctt ctgttgacat acacaggtga tccagaactn ccgtgagtgt ccttcccgac 240
gagatttccc tctggggtga attttgtgcg gggtggccct caaagctcct ctctaccacc 300
cgtgaggacc ctccccaaag acttttattt cttttaaag tcttgggaaa agccctgctt 360
ttcctccttt ta                                                    372
```

```
<210> 87
<211> 924
<212> DNA
<213> Homo sapiens


<220>
<223> Genbank Accession No. U41344


<400> 87
```

```
agttcagaga gaagtctaca gtccttgtct cggggtgtct tcccccttcc ccttcctcat 60
cttcccgcc agcctccact cccttctgat ttctcgtctt cttttccgt agaaatcaac 120
ggaacccaga tttgccccaa cgacctagtg gcgttccatg acttctcctc ggacctggag 180
aacgtgccac acctgcgcta cctgcggctg gatggaaact acttgaagcc gcccatcccg 240
ctggacctca tgatgtgctt ccgcctcctg cagtccgtgg tcatctaggc cctactccgc 300
caccggatct gctctgaccg cacttgaagg ctggggccca ggacctgtgc cggccattcg 360
ttttctctct ctcccttct ttctcccagc tttgcctcct tatgccacct cgaggcaggg 420
aaaagccatc tatacttctg cagcctaagg agcgagactt caaggactca gtttggttcc 480
acccagttga aagacaccca gtgcacaccc aaactcctgg ccttctgtgg tttcccttttg 540
ctccagaaac acagatgtgt ctaaagactt ggtgtcccct tctctctcct ccccaccccg 600
ccactcctgg gtacatctgg gccgtggact atctgatctt ggtcctggcc gagaaacagc 660
ccggagtaag gttcagaaag tcccCctggg gactcctcca tcttcggcag ctctggctca 720
aagaggccga gaaacccagt tctcctgggc caaggatccc ttctggcaaa gctgctgctc 780
cgccgcttgg ttccccggca ccagacatcg ccctggccct gctggccggg gtatcggaag 840
gaggagcgag ggaatgacg aggtagggtg cagggtaagg gctcccaggt cttcatctgg 900
ccagcaggac acagggatct aagg                                        924
```

```
<210> 88
<211> 511
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI765890

<400> 88
tgcttttgaa ttattgattt attgcacatc aggagaaaca caagattact gctataataa 60
attcactctt acatgcttta gcaaaaatca gtaaaaatag aaacatggt aacaattaaa 120
gtgaaaaaat tggggtcatt aaagaatgtc tgactgatta gcttgcagtt tttgagacgg 180
ctgagaacta ccatcaatga gatcacctta aacaaacact cttaatgact tgaaaaagtc 240
cccatcccaa agtcaactat aggtattcaa tattgtatat ttaactgaat ttaaagttat 300
gttaaaccc attttattga agtaagagaa gaattccttt tacattatca ttctcaagcc 360
atatatcaag aaaaagattg aaattacatt cctttttttt ttttaatag agacaagttc 420
tcgctgtgtt gcccaggctg gtctcgaact cctaggttca agtgatcctc ctgccttgtc 480
ctgccaaagt gctgggatta caggcatgag c                                511
```

```
<210> 89
<211> 318
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AL043089

<220>
<221> unsure
<222> (1)..(318)
<223> n = a or c or g or t

<400> 89
gtgggttgga gactcagcag gctccgtgca gcccttggga acagtgagag gttgaaggtc 60
ataacgagag tgggaactca acccagatcc cgccctcct gtcctctgtg ttcccgcgga 120
aaccaaccaa accgtgcgct gtgacccatt gctgttctct gtatcgtgat ctatcctcaa 180
caacaacaga aaaaaggaat aaaatatcct ttgtttccta aaaaaaaaaa aaaaaaaaaa 240
aaaaaaaaa aaaaaaaaa aaaaaaaaa aaaaaaaaa aaagggggcgg ccgntntaaa 300
ggatccaagc ttacgtnc                                               318
```

```
<210> 90
<211> 716
<212> DNA
<213> Homo sapiens
```

<220>
<223> Genbank Accession No. M11433

<400> 90
```
gggggggggc ggagggcgct catttccggg ccgcccacca cccgcgtagc accggcagcc 60
gctgtcccgg cagtctccag ccgtcccgcc cgcttgtggc caaactggct ccagtcactc 120
ccgaaatgcc agtcgacttc actgggtact ggaagatgtt ggtcaacgag aatttcgagg 180
agtacctgcg cgccctcgac gtcaatgtgg ccttgcgcaa aatcgccaac ttgctgaagc 240
cagacaaaga gatcgtgcag gacggtgacc atatgatcat ccgcacgctg agcactttta 300
ggaactacat catggacttc caagttggga aggagtttga ggaggatctg acaggcatag 360
atgaccgcaa gtgcatgaca acagtgagct gggacggaga caagctccag tgtgtgcaga 420
agggtgagaa ggaggggcgt ggctggaccc agtggatcga gggtgatgag ctgcacctag 480
agatgagagt ggaaggtgtg gtctgcaagc aagtattcaa gaaggtgcag tgaggcccaa 540
gcagacaacc ttgtcccaac caatcagcag gatgtgtgag ccaggatccc tctttgcaca 600
gcatgaggca aaaatgtcca gccacccta ggcatctgtt agcagagtct gtctcttggc 660
tttgtcactt ttccttttct taaaacaaag ccatgccaat aaagtgacct gtgttc    716
```

<210> 91
<211> 2052
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. Y11307

<400> 91
```
gcggccgcgt cgacgcgccc ccgagcagcg cccgcgccct ccgcgccttc tccgccggga 60
cctcgagcga aagacgcccg cccgccgccc agccctcgcc tccctgccca ccgggcacac 120
cgcgccgcca ccccgacccc gctgcgcacg gcctgtccgc tgcacaccag cttgttggcg 180
tcttcgtcgc cgcgctcgcc ccgggctact cctgcgcgcc acaatgagct cccgcatcgc 240
cagggcgctc gccttagtcg tcacccttct ccacttgacc aggctggcgc tctccacctg 300
ccccgctgcc tgccactgcc ccctggaggc gcccaagtgc gcgccgggag tcgggctggt 360
ccgggacggc tgcggctgct gtaaggtctg cgccaagcag ctcaacgagg actgcagcaa 420
aacgcagccc tgcgaccaca ccaaggggct ggaatgcaac ttcggcgcca gctccaccgc 480
tctgaagggg atctgcagag ctcagtcaga gggcagaccc tgtgaatata actccagaat 540
ctaccaaaac ggggaaagtt tccagcccaa ctgtaaacat cagtgcacat gtattgatgg 600
cgccgtgggc tgcattcctc tgtgtcccca agaactatct ctccccaact tgggctgtcc 660
caaccctcgg ctggtcaaag ttaccgggca gtgctgcgag gagtgggtct gtgaccagga 720
tagtatcaag gaccccatgg aggaccagga cggcctcctt ggcaaggagc tgggattcga 780
tgcctccgag gtggagttga cgagaaacaa tgaattgatt gcagttggaa aaggcagctc 840
actgaagcgg ctccctgttt ttggaatgga gcctcgcatc ctatacaacc ctttacaagg 900
ccagaaatgt attgttcaaa caacttcatg gtcccagtgc tcaaagacct gtggaactgg 960
tatctccaca cgagttacca atgacaaccc tgagtgccgc cttgtgaaag aaacccggat 1020
ttgtgaggtg cggccttgtg gacagccagt gtacagcagc ctgaaaaagg gcaagaaatg 1080
cagcaagacc aagaaatccc ccgaaccagt caggtttact tacgctggat gtttgagtgt 1140
gaagaaatac cggcccaagt actgcggttc ctgcgtggac ggccgatgct gcacgcccca 1200
gctgaccagg actgtgaaga tgcggttccg ctgcgaagat ggggagacat tttccaagaa 1260
cgtcatgatg atccagtcct gcaaatgcaa ctacaactgc ccgcatgcca atgaagcagc 1320
gtttcccttc tacaggctgt tcaatgacat tcacaaattt agggactaaa tgctacctgg 1380
gtttccaggg cacacctaga caaacaaggg agaagagtgt cagaatcaga atcatggaga 1440
aaatgggcgg gggtggtgtg ggtgatggga ctcattgtag aaaggaagcc ttgctcattc 1500
ttgaggagca ttaaggtatt tcgaaactgc caagggtgct ggtgcggatg gacactaatg 1560
cagccacgat tggagaatac tttgcttcat agtattggag cacatgttac tgcttcattt 1620
tggagcttgt ggagttgatg actttctgtt ttctgtttgt aaattatttg ctaagcatat 1680
tttctctagg cttttttcct ttggggcttc tacagtcgta aaagagataa taagattagt 1740
tggacagttt aaagctttta ttcgtccttt gacaaaagta aatgggaggg cattccatcc 1800
cttcctgaag ggggacactc catgagtgtc tgtgagaggc agctatctgc actctaaact 1860
gcaaacagaa atcaggtgtt ttaagactga atgttttatt tatcaaaatg tagcttttgg 1920
ggagggaggg gaaatgtaat actggaataa tttgtaaatg attttaattt tatattcagt 1980
gaaaagattt tatttatgga attaaccatt taataaagaa atatttacct aaaaaaaagt 2040
```

cgacgcggcc gc   2052

<210> 92
<211> 748
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI078144

<220>
<221> unsure
<222> (1)..(748)
<223> n = a or c or g or t

<400> 92
```
ttttgtggat tttcctttta atgcaaaatg ttgcaataca aaacaatgtg gagaaagtcc 60
tgttcctcag gacactgaag ggaggagtga ggaagagagg acagagctgg acgtctcctc 120
ctatttctcc ctccccaagt cactctgagg ggaagaacac tgctgcctgc tccctgggcc 180
tgcccgcata caaggttaga gccctgggtc tggggcatcc ttagcctgaa atttgttgac 240
atggggcagg agagcaggag ggaacattga gggttttgac tcttcgggct ctaaaaggat 300
tactcaggat ctggagttcc gtatgaaaca aaggagctga aagaatttga ttgccattgg 360
ctaaaaatat agaggatttg agccacaact ggcccacatt tgaagaatga ggaacaagaa 420
atttagtggg gatataatat aaatgtatgg gagtgagaaa gatgcaaaaa acaaggctag 480
ctcctcaaac ctcctcctct ttcttcctca tctccagctt atagacaatc tggtagccat 540
catcccaggc atagagctgg cgttctcggg ggttatagcg gaggctggca tgggcaccat 600
atctgcggng aaaataaggg agtgctgccc gttcaggggt cagggtgccg ctggcatcaa 660
aggagcactg gatgcgggcc cgactggcag gacgggtgtt atagacgaca tagaaggtcc 720
cacagatgac aaaggcagcc tcagcatt                                       748
```

<210> 93
<211> 602
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AA122235

<220>
<221> unsure
<222> (1)..(602)
<223> n = a or c or g or t

<400> 93
```
gggagattaa aaccttggat tctaggtggt agaggataat ttttttttga atgaatttct 60
ttttatttat ttatttattt ttttcctttt taggatagaa ttttttgcggc atttgaagag 120
cttttttccag attatgttta aaattgaaac caagccatgt ggtgaagaac tcaagggtgg 180
ggataaagtg ctgatgacct gtgttggcat tggtttctcc aaccttagca agaccctcaa 240
gtgataacca tcacaagata aggccccaat gcctacagac aaagcagaag ctgccacgga 300
caccaatggg accaagtcca aatggattaa tccaggacag aatagccact tgcttaattt 360
tctgtgaaga aatatcaata tacaaataaa agacatccct gtagcatatg gtttccagct 420
gtttctccag tggcattgca ttgcccagga gggnccagtc accatgagag ctcccttgcc 480
ttacctggag gaagaatgtg cttcaggcac agtcgtgctg ctagaacagt ctcatagctg 540
cagttcantg tcttcctcag ctactatcat angttcctca gccctgtcat atgctgtttc 600
ca                                                                   602
```

<210> 94
<211> 674
<212> DNA
<213> Homo sapiens

```
<220>
<223> Genbank Accession No. AI342377

<220>
<221> unsure
<222> (1)..(674)
<223> n = a or c or g or t

<400> 94
gagatttccc aggactggct ttaatttgaa aaatctgatt ggggtctctt cccgtatcag 60
agaaggaaca gcccaagcta tgaccccagg gccagggaat tcagtcccca ccagaccctg 120
tcattccatc actagggggt aattccaggc tccccctgcc agccctgaga caggaggacg 180
gatgtgaagt tgcccaggac tagattctgt ctctccaaag tggcccaagc cctgttctct 240
gtactaggga agccagctgt gtcttttcga ggacagttgg tccagccagc aggctcagtt 300
cagataccag acaaccattc cagcacgagg gctcagcgcc ctggccccgg cggtcgctcc 360
agtgcctgtg tgcccaccag cacatccatg aggtagtcca attcggcctc gtccagctcc 420
ggagcttcct ccttgcccgg cccatcctca gggcctggtt tgaggccctc agaggctggt 480
gcccanagtt cattgtcata catagaggtg tcaatatcct caaacaggcc ctcaagccca 540
tcgtccagta gacagccagt ggctgggccc agcaggtcca aggcacccag gctgggcgct 600
gctcccccga tgctactggc ctgtgggccc ctcgtctgcc aagggttggg agcctgactc 660
angcccctcg tgcc                                                  674

<210> 95
<211> 1155
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. U86529

<400> 95
aagacacggg cctgattcgt cgagtctcac tgagccttag tcgtcggcag gtcccaggcg 60
cgaagtttct cggcctggag gaggggtcg cgcgaagtgc cagatgcagg cggggaagcc 120
catcctctat tcctatttcc gaagctcctg ctcatggaga gttcgaattg ctctggcctt 180
gaaaggcatc gactacaaga cggtgcccat caatctcata aaggataggg gccaacagtt 240
ttctaaggac ttccaggcac tgaatcctat gaagcaggtg ccaaccctga agattgatgg 300
aatcaccatt caccagtcac tggccatcat tgagtatcta gaggagacgc gtcccactcc 360
gcgacttctg cctcaggacc caaagaagag ggccagcgtg cgtatgattt ctgacctcat 420
cgctggtggc atccagcccc tgcagaacct gtctgtcctg aagcaagtgg gagaggagat 480
gcagctgacc tgggcccaga cgccatcac ttgtggcttt aacgccctgg agcagatcct 540
acagagcaca gcgggcatat actgtgtagg agacgaggtg accatggctg atctgtgctt 600
ggtgcctcag gtggcaaatg ctgaaagatt caaggtggat ctcaccccct accctaccat 660
cagctccatc aacaagaggc tgctggtctt ggaggccttc caggtgtctc acccctgccg 720
gcagccagat acacccactg agctgagggc ctagctccca aatcctgccc cgttggcaca 780
gggccacagg agcagaagct gggtgggctg aagaggcctg gaaacgagag tcttaattga 840
ggagatggga gactcgaact ctagccctgg atctgccttc ctgctgaaac ttgttccacc 900
tcagtcccct catctgtcac acgcatgtgg ggtggagtag ggagatgcgg ggagcagggt 960
gggcaggaat actgttatct atgtgacggg gcagtcgtga ggctgagatg agaatgcgga 1020
ttaaaatgcc tggcgtgctc accgtaacac cacggggaag gctgtgtgcc ttttctcatc 1080
cgcttttgtt gtgtgtgact ccaaagaatg cccgcgctga aatttggcgt gaattaaact 1140
gaagcccagg cctct                                                 1155

<210> 96
<211> 391
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI680350

<220>
```

<221> unsure
<222> (1)..(391)
<223> n = a or c or g or t

<400> 96
ttttttcatta aaaaataggg ctctttatta taaattactg aaatgtttct tttctgaata 60
taaatataaa tatgtgcaaa gtttgacttg gattgggatt ttgttgagtt cttcaagcat 120
ctcctaatag cctcaagggc ctgagtaggg gggaggagag aggactggag gtggaatctt 180
tataaaagac agagtgattg aggcagattg taaacattat taaaaaacaa gaaacaaaca 240
aaaaaataga gaaaaaaacc accccaacac acaactgccc tgtccagccc aatacctgac 300
acagaatact ntgtgtttgt ttagttgccc ccccccacaa aaacaaaaac aaaaacaaaa 360
acaaaaaact gttccaggta attccatcgc t   391

<210> 97
<211> 620
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AA576961

<400> 97
gttttttttt tttttaatat cagagtttta atttcaacca gctggcacaa caatgaaagt 60
gtcagacttt ctgaaagtac tcgagaaata atgaataaat tcttaatgtt ttccccctcca 120
ccgcccttt ttattctcca agattaggaa ttactacgga ttaggttttt gaaaataaag 180
tttcctttt ggaaaatggt ctacattcag aaatgtctta gaacaagcat ttaaaaaaaa 240
ctaataaata atcataaatc aaaatacatt aaaataaaat tacagtacat catcgctcct 300
agaaaattca ccatacaaga cgatcctttc aaaggttcat aaataaaagt cttcttgact 360
cgaaatcgtt tcctgcatcg tgatgaaaag tatgcagaaa actaagaaga atcgcaagtc 420
ttcagtaggg tgatgtccaa actacttgat ctggtgcggg gcggagagac tgttttgctt 480
ttgatccaag tgaagacaat agaaatgtgc tcgtcccact tcctcaagtc ctcaaaacct 540
tgtcttgccc gggagctgcc cctttcaggc agagttggag gtgctgcgga gaagccggtg 600
cccgtgcggc tgcgagtgcg   620

<210> 98
<211> 1108
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. U75744

<400> 98
ggcagagcag gggtagactt agcatgtaag ggagggtcag ttggtcctgc aacaggtagg 60
acatccctcg ggtacaatgg agcagcacca ggatgtcacg ggagctcctcc aacgtcaggt 120
ttctcctcct ctccatccac agcgccctgg ccatgaggat ctgctccttc aacgtcaggt 180
cctttgggga aagcaagcag gaagacaaga atgccatgga tgtcattgtg aaggtcatca 240
aacgctgtga catcatactc gtgatggaaa tcaaggacag caacaacagg atctgcccca 300
tactgatgga gaagctgaac agaaattcaa ggagaggcat aacgtacaac tatgtgatta 360
gctctcggct tggaagaaaa acatataaag aacaatatgc ctttctctac aaggaaaagc 420
tggtgtctgt gaagaggagt tatcactacc atgactatca ggatggagac gcagatgtgt 480
tttccaggga gccctttgtg gtctggttcc aatctcccca cactgctgtc aaagacttcg 540
tgattatccc cctgcacacc accccagaga catccgttaa ggagatcgat gagttggttg 600
aggtctacac ggacgtgaaa caccgctgga aggcggagaa tttcatttc atgggtgact 660
tcaatgccgg ctgcagctac gtccccaaga aggcctgaa gaacatccgc ttgaggactg 720
accccaggtt tgtttggctg atcggggacc aagaggacac cacggtgaag aagagcacca 780
actgtgcata tgacaggatt gtgcttagag gacaagaaat cgtcagttct gttgttccca 840
agtcaaacag tgttttgac ttccagaaag cttacaagct gactgaagag gaggccctgg 900
atgtcagcga ccactttcca gttgaattta aactacagtc ttcaagggcc ttcaccaaca 960
gcaaaaaatc tgtcactcta aggaagaaaa caaagagcaa acgctcctag acccaagggt 1020
ctcatcttat taaccatttc ttgcctctaa ataaaatgtc tctaacagat atgaactgct 1080

```
ccctgtactt aggaaaaaaa aaaaaaaa                                    1108
```

```
<210> 99
<211> 3921
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. M59371

<400> 99
cggaagttgc gcgcaggccg gcgggcggga gcggacaccg aggccggcgt gcaggcgtgc 60
gggtgtgcgg gagccgggct cggggggatc ggaccgagag cgagaagcgc ggcatggagc 120
tccaggcagc ccgcgcctgc ttcgccctgc tgtggggctg tgcgctggcc gcggccgcgg 180
cggcgcaggg caaggaagtg gtactgctgg actttgctgc agctggaggg gagctcggct 240
ggctcacaca cccgtatggc aaagggtggg acctgatgca gaacatcatg aatgacatgc 300
cgatctacat gtactccgtg tgcaacgtga tgtctggcga ccaggacaac tggctccgca 360
ccaactgggt gtaccgagga gaggctgagc gtaacaactt tgagctcaac tttactgtac 420
gtgactgcaa cagcttccct ggtggcgcca gctcctgcaa ggagactttc aacctctact 480
atgccgagtc ggacctggac tacggcacca acttccagaa gcgcctgttc accaagattg 540
acaccattgc gcccgatgag atcaccgtca gcagcgactt cgaggcacgc acgtgaagc 600
tgaacgtgga ggagcgctcc gtggggccgc tcacccgcaa aggcttctac ctggccttcc 660
aggatatcgg tgcctgtgtg gcgctgctct ccgtccgtgt ctactacaag aagtgccccg 720
agctgctgca gggcctggcc cacttccctg agaccatcgc cggctctgat gcaccttccc 780
tggccactgt ggccggcacc tgtgtggacc atgccgtggt gccaccgggg ggtgaagagc 840
cccgtatgca ctgtgcagtg gatggcgagt ggctggtgcc cattgggcag tgcctgtgcc 900
aggcaggcta cgagaaggtg gaggatgcct gccaggcctg ctcgcctgga tttttttaagt 960
ttgaggcatc tgagagcccc tgcttggagt gccctgagca cacgctgcca tcccctgagg 1020
gtgccacctc ctgcgagtgt gaggaaggct tcttccgggc acctcaggac ccagcgtcga 1080
tgccttgcac acgacccct tccgccccac actacctcac agccgtgggc atgggtgcca 1140
aggtggagct gcgctggacg ccccctcagg acagcggggg ccgcgaggac attgtctaca 1200
gcgtcacctg cgaacagtgc tggcccgagt ctggggaatg cgggccgtgt gaggccagtg 1260
tgcgctactc ggagcctcct cacggactga cccgcaccag tgtgacagtg agcgacctgg 1320
agccccacat gaactacacc ttcaccgtgg aggcccgcaa tggcgtctca ggcctggtaa 1380
ccagccgcag cttccgtact gccagtgtca gcatcaacca gacagagccc cccaaggtga 1440
ggctggaggg ccgcagcacc acctcgctta gcgtctcctg gagcatcccc cgccgcagc 1500
agagccgagt gtggaagtac gaggtcactt accgcaagaa gggagactcc aacagctaca 1560
atgtgcgccg caccgagggt ttctccgtga ccctggacga cctggcccca gacaccacct 1620
acctggtcca ggtgcaggca ctgacgcagg agggccaggg ggccggcagc aaggtgcacg 1680
aattccagac gctgtccccg gagggatctg gcaacttggc ggtgattggc ggcgtggctg 1740
tcggtgtggt cctgcttctg gtgctggcag gagttggctt ctttatccac cgcaggagga 1800
agaaccagcg tgcccgccag tccccggagg acgtttactt ctccaagtca gaacaactga 1860
agccctgaa gacatacgtg gacccccaca catatgagga ccccaaccag gctgtgttga 1920
agttcactac cgagatccat ccatcctgtg tcactcggca gaaggtgatc ggagcaggag 1980
agtttggggga ggtgtacaag ggcatgctga gacatcctc ggggaagaag gaggtgccgg 2040
tggccatcaa gacgctgaaa gccggctaca cagagaagca gcgagtggac ttcctcggcg 2100
aggccggcat catgggccag ttcagccacc acaacatcat ccgcctagag ggcgtcatct 2160
ccaaatacaa gcccatgatg atcatcactg agtacatgga aatggggccc ctggacaagt 2220
tccttcggga gaaggatggc gagttcagcg tgctgcagct ggtgggcatg ctgcgggca 2280
tcgcagctgg catgaagtac ctggccaaca tgaactatgt gcaccgtgac ctggctgccc 2340
gcaacatcct cgtcaacagc aacctggtct gcaaggtgtc tgactttggc ctgtcccgcg 2400
tgctggagga cgaccccgag gccacctaca ccaccagtgg cggcaagatc cccatccgct 2460
ggaccgcccc ggaggccatt tcctaccgga agttcacctc tgccagcgac gtgtggagct 2520
ttggcattgt catgtgggag gtgatgacct atggcgagcg gcccctactgg gagttgtcca 2580
accacgaggt gatgaaagcc atcaatgatg gcttccggct ccccacaccc atggactgcc 2640
cctccgccat ctaccagctc atgatgcagt gctggcagca ggagcgtgcc cgccgcccca 2700
gttcgtcagc atcctggaca agctcattcg tgccctgac tccctcaaga 2760
ccctggctga ctttgacccc cgcgtgtcta tccggctccc cagcacgagc ggctcggagg 2820
gggtgccctt ccgcacggtg tccgagtggc tggagtccat caagatgcag cagtatacgg 2880
agcacttcat ggcggccggc tacactgcca tcgagaaggt ggtgcagatg accaacgacg 2940
acatcaagag gattgggggtg cggctgcccg ccaccagaa gcgcatcgcc tacagcctgc 3000
```

```
tgggactcaa ggaccaggtg aacactgtgg ggatccccat ctgagcctcg acagggcctg 3060
gagccccatc ggccaagaat acttgaagaa acagagtggc ctccctgctg tgccatgctg 3120
ggccactggg gactttattt atttctagtt ctttcctccc cctgcaactt ccgctgaggg 3180
gtctcggatg acaccctggc ctgaactgag gagatgacca gggatgctgg gctgggccct 3240
ctttccctgc gagacgcaca cagctgagca cttagcaggc accgccacgt cccagcatcc 3300
ctggagcagg agccccgcca cagccttcgg acagacatat aggatattcc caagccgacc 3360
ttccctccgc cttctcccac atgaggccat ctcaggagat ggagggcttg gcccagcgcc 3420
aagtaaacag ggtacctcaa gccccatttc ctcacactaa gagggcagac tgtgaacttg 3480
actgggtgag acccaaagcg gtccctgtcc ctctagtgcc ttctttagac cctcgggccc 3540
catcctcatc cctgactggc caaaccttg ctttcctggg cctttgcaag atgcttggtt 3600
gtgttgaggt ttttaaatat atattttgta ctttgtggag agaatgtgtg tgtgtggcag 3660
ggggcccgc cagggctggg gacagagggt gtcaaacatt cgtgagctgg ggactcaggg 3720
accggtgctg caggagtgtc ctgcccatgc cccagtcggc cccatctctc atccttttgg 3780
ataagtttct attctgtcag tgttaaagat tttgttttgt tggacatttt tttcgaatct 3840
taatttatta tttttttat atttattgtt agaaaatgac ttatttctgc tctggaataa 3900
agttgcagat gattcaaacc g                                             3921
```

<210> 100
<211> 1247
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AF040639

<220>
<221> unsure
<222> (1)..(1238)
<223> n = a or c or g or t

<400> 100
```
ggaattcgcc gcccgctccg agcctggtgc ttccgaccgc tgcgcgcggc tcctgggctg 60
tcacagtctc ccgttgccgc cgtcatgtcc cggcagctgt cgcgggcccg gccagccacg 120
gtgctgggcg ccatggagat ggggcgccgc atggacgcgc ccaccagcgc cgcagtcacg 180
cgcgccttcc tggagcgcgg ccacaccgag atagacacgg ccttcgtgta cagcgacggc 240
cagtccgaga ccatccttgg cggcctgggg ctccggctgg cggcagcga ctgcagagtg 300
aaaattgata ccaaggccat tccactgttt gggaactccc tgaagcctga cagtctccgg 360
ttccagctgg agacgtcact gaagcggctg cagtgtcccc gagtggacct cttctacctg 420
catatgccag accacagcac cccggtggaa gagacactgc gtgcctgcca ccagctgcac 480
caggagggca agttcatgga gcttggcctc tccaactatg cagcctggga agtggccgag 540
atctgtaccc tctgcaagag caacggctgg atcctgccca ctgtgtacca gggcatgtac 600
aatgccatca cccggcaggt ggaaacggag ctcttcccct gcctcaggca ctttggactg 660
aggttctatg ccttcaaccc tctggctggg ggcctgctga ccggcaagta caagtatgag 720
gacaaggatg ggaaacagcc tgtgggccgc ttctttggga atacctgggc agagatgtac 780
aggaatcgct actggaagga gcaccacttt gagggcattg ccctggtgga gaaggccctg 840
caggccgcgt atggcgccag cgcccccagc atgacctcgg ccaccctccg gtggatgtac 900
caccactcac agctgcaggg tgccacggg gacgcggtca tcctgggcat gtccagcctg 960
gagcagctgg agcagaactt ggcagcggca gaggaagggc ccctggagcc ggctgtcgtg 1020
gacgccttta atcaagcctg gcatttggtt gctcacgaat gtcccaacta cttccgctag 1080
gcccatcgtt tctcaggctg cccaaggctc ttctgtaaca tcttttgtta ctcacatttt 1140
ctttaattta gaactgcctc agtaaattct tagggatgga agtntttgga caaaaaccta 1200
atagaagagt caccaccaaa tgaagaataa aactcccaaa aaaaaaa       1247
```

<210> 101
<211> 1450
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. M12963

```
<400> 101
gatgcacttg agcagggaag aaatccacaa ggactcacca gtctcctggt ctgcagagaa 60
gacagaatca acatgagcac agcaggaaaa gtaatcaaat gcaaagcagc tgtgctatgg 120
gagttaaaga aaccctttc cattgaggag gtggaggttg cacctcctaa ggcccatgaa 180
gttcgtatta agatggtggc tgtaggaatc tgtggcacag atgaccacgt ggttagtggt 240
accatggtga ccccacttcc tgtgattta ggccatgagg cagccggcat cgtggagagt 300
gttggagaag gggtgactac agtcaaacca ggtgataaag tcatcccact cgctattcct 360
cagtgtggaa aatgcagaat ttgtaaaaac ccggagagca actactgctt gaaaaacgat 420
gtaagcaatc ctcaggggac cctgcaggat ggcaccagca ggttcacctg caggaggaag 480
cccatccacc acttccttgg catcagcacc ttctcacagt acacagtggt ggatgaaaat 540
gcagtagcca aaattgatgc agcctcgcct ctagagaaag tctgtctcat tggctgtgga 600
tttttcaactg gttatgggtc tgcagtcaat gttgccaagg tcaccccagg ctctacctgt 660
gctgtgtttg gcctgggagg ggtcggccta tctgctatta tgggctgtaa agcagctggg 720
gcagccagaa tcattgcggt ggacatcaac aaggacaaat ttgcaaaggc caaagagttg 780
ggtgccactg aatgcatcaa ccctcaagac tacaagaaac ccatccagga ggtgctaaag 840
gaaatgactg atggaggtgt ggatttttca tttgaagtca tcggtcggct tgacaccatg 900
atggcttccc tgttatgttg tcatgaggca tgtggcacaa gtgtcatcgt aggggtacct 960
cctgattccc aaaacctctc aatgaaccct atgctgctac tgactggacg tacctggaag 1020
ggagctattc ttggtggctt taaaagtaaa gaatgtgtcc caaaacttgt ggctgatttt 1080
atggctaaga agttttcatt ggatgcatta ataacccatg ttttaccttt tgaaaaaata 1140
aatgaaggat ttgacctgct tcactctggg aaaagtatcc gtaccattct gatgtttga 1200
gacaatacag atgttttccc ttgtggcagt cttcagcctc ctctacccta catgatctgg 1260
agcaacagct gggaaatatc attaattctg ctcatcacag atttatcaa taaattacat 1320
ttgggggctt ccaaagaaa tggaaattga tgtaaaatta tttttcaagc aaatgtttaa 1380
aatccaaatg agaactaaat aaagtgttga acatcagctg gggaattgaa gccaataaac 1440
cttccttctt 1450


<210> 102
<211> 38059
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. K02402

<400> 102
gtatatctag aaaaccccat tgtctcattc caaaatcacc ttaagatgga taggcaactt 60
cagcaaagtc tcaggataac aaaaatcaatg tgcaaaaatc acaggcattc ttatacacca 120
atagcagaca aacagacagc caaatcatga gtgaactccc attcacaatt gcttcaaaga 180
gaataaaata cctaggaatc ctacttacaa gggatgtgaa ggacctcttc aaggagaact 240
acaaaccact gctcaatgaa ataaaagagg atacaaacaa atggaagaac attacatgct 300
catgggtagg aagaatcaat atcatgaaaa tggccataat gcccaaggta atttatagat 360
tcaatgccat ccccatcaag ctaccaatga ctttcttcac agaattggaa aaaactactt 420
taaagttcat atggaaccaa aaaagagccc gcatcgccaa gtcaatccta agccaaaaga 480
acaaagctgg aggcatcatg ctacctgact tcaaactata ctacaaggct acagtaacca 540
aaacagcatg gtactggtac caaaacagag atacagacca atggaacaga acagagccct 600
cagaaataat gccacatatc tacaactatc tgatctttga aaaacctgac aaaaacaaga 660
aatgggaaa ggaatcccta attaaaaat ggtgctggga aaactggcta gccatatgta 720
gaaagctgaa actggatccc ttccttatac cttatacaaa aattaattca agatggatta 780
aagacttcat tgttagacct aaaaccataa aaaccctaga agaaaaccta ggcaatacca 840
ttcaggacat aggcatgggc ttggacttca tgtctaaaac accaaaagca atggcaacaa 900
aagccaaaat tgacaaatgg gatcaaatga aactaaagag cttctgcaca gcaaaagaaa 960
ctaccatcag agtgaacagg caacctaaag aatgggagaa aatttttgca atctactcat 1020
ctgtccaagg gctaatatct agaatctaaa atgaactcaa acaaatttac agaaaaaaac 1080
aaacaacccc atcaacaagt gggtgaagga tatgaacaga cacttctcaa aagaagacat 1140
ttatgcagcc aacagacaca tgaaaaaatg ctcagcatca ccggccatca gagaaatgca 1200
aatcaaaacc acaatgagat accatctcac acagttaga atggcgatca tcaaaaactc 1260
aggaagcaac aggtgctgga gaggatgtgg agaaatagga acactttgac actgttggtg 1320
ggactgtaaa ctagttcaac cattgtggaa gtcagtgtgg cgattcctca gggatctaga 1380
cctagaaata ccatctgacc cagccatccc attattgggt atataccaaa gtattataaa 1440
tcatgctgct ataaagacac atgcacacgt atgtttattg cggcactttt cacaatagca 1500
```

```
atgacttgga accaacccaa atgtccaaca atgatagact ggattaagaa aatgtggcac 1560
atatacacct aggaatacta ggcagccata aaaagaaaat gagttcatgt cctttgtagg 1620
gcatggatga agctagaaac catcattctc agcaaactat cgcaaggaca aaaaaccaaa 1680
caccgcatgt tctcactcat aggtgggaac tgaacaatga gaacacttgg acacaggaag 1740
gggaacatca cacaccgggg cctgttgtgg ggtggggggc gaggggaggg atagcattag 1800
gggatatacc taatgctaaa tgacgagtta atgggtacag cacaccaaca tggcacatgt 1860
atacatatgt aacaaacctg ctcgttgtgc acatgtaccc taaaacttaa agtataataa 1920
taaaaaaaag atcattctaa aatttataca agcccttaga acagttaaaa atatcttacc 1980
aaaagaagaa taaagttgga ggaatcactc tacctaatat aaagtcttac tacatagcta 2040
cagtaattat gacagtgtta tattggcaga gggataaata catcaatggc acaaagaata 2100
gatagagaaa ctggaagtag acccaaaaca atatggttaa ctgacttacg aaaaaatttc 2160
agaagccatt cagtcgagga aggatagggt ggtattgttg ttttttgttt taacaaattg 2220
tgctggataa attggacata cctatggaaa aaaaaatgaa gtttgaccta aacatcatac 2280
tttacacaaa tattaactca aaatggagca tgggcataaa tctaaaactt caaactgtaa 2340
aacatttaga aaaaaatagg aaaaaaacta tcaggatcta gtgttagtgg aagagttcta 2400
aatgtgatcc ataaaacaaa aacaaataaa ctggactaca tcaaaactaa aaaattctac 2460
tctgtgaaag acctaattaa gaggacaaaa gacaagctac aggctggaga caatatattt 2520
aatccacgta tctatgaaag gattcatatc tagaatatat aaacaacctt aagaatctga 2580
cagtaaaaaa aaaaaatcag actaactgga ccactcatac attgctgatg gaaatgtaaa 2640
gtggtacagc cattttggta aacatcattg ctctctgaca aagatacggt gggtcccact 2700
gatgaactgt gctgccacag taaatgtagc cactatgcct atctccattc tgaagatgtg 2760
tcacttcctg tttcagactc aaatcagcca cagtggcaga agcccacgaa atcagaggtg 2820
aaatttaata atgaccactg cccattctct tcacttgtcc caagaggcca ttggaaatag 2880
tccaaagacc cattgaggga gatggacatt atttcccaga agtaaataca gctcagcttg 2940
tactttggta caactaatcg accttaccac tttcacaatc tgctagcaaa ggttatgcag 3000
cgcgtgaaca tgatcatggc agaatcacca ggcctcatca ccatctgcct tttaggatat 3060
ctactcagtg ctgaatgtac aggtttgttt cctttttaa aatacattga gtatgcttgc 3120
cttttagata tagaaatatc tgatgctgtc ttcttcacta aattttgatt acatgatttg 3180
acagcaatat tgaagagtct aacagccagc acgcaggttg gtaagtactg gttctttgtt 3240
agctaggttt tcttcttctt cattttaaa actaaataga tcgacaatgc ttatgatgca 3300
tttatgttta ataaacactg ttcagttcat gatttggtca tgtaattcct gttagaaaac 3360
attcatctcc ttggtttaaa aaaattaaaa gtgggaaaac aaagaaatag cagaatatag 3420
tgaaaaaaaa taaccacatt attttgtttt ggacttacca ctttgaaatc aaaatgggaa 3480
acaaaagcac aaacaatggc cttatttaca caaaagtct gattttaaga tatatgacat 3540
ttcaaggttt cagaagtatg taatgaggtg tgtctctaat tttttaaatt atatatcttc 3600
aatttaaagt tttagttaaa acataaagat taacctttca ttagcaagct gttagttatc 3660
accaaagctt ttcatggatt aggaaaaaat cattttgtct ctatgtcaaa catcttggag 3720
tttgattatt tggggaaaca caatactcag ttgagttccc taggggagaa aagcaagctt 3780
aagaattgac ataaagagta ggaagttagc taatgcaaca tatatcactt tgtttttttca 3840
caactacagt gactttatgt atttcccaga ggaaggcata cagggaagaa attatcccat 3900
ttggacaaac agcatgttct cacaggaagc atttatcaca cttacttgtc aactttctag 3960
aatcaaatct agtagctgac agtaccagga tcagggtgc caaccctaag caccccagga 4020
aagctgactg gccctgtggt tcccactcca gacatgatgt cagctgtgaa atcagactga 4080
aatgctgaaa taacgataaa aaaaaataca gaggttaaac tagcaaagtg agtaaagtca 4140
agggatataag aaaatttgtt ggaaaactca caaagcagga cataaagcaa ggccattaga 4200
tatatctcat tagtgtgaca tctgggagga caaagcatcc aaaccctttc ttctatataa 4260
gtggtgagat gatgaaggtt gtaagaggct tctgcccccct tgaagacttc agatgctggg 4320
gaaaggatag ataagaataa ggatgaacct ggcttttgga gcctgggaaa taatgactag 4380
cgataaacct gaagggaagt taagtatacg atccccagat aatactaagg agaaaggcaa 4440
tgtgattctg cagccattgt agccagagat aataagccct tgaggaaggg gccaggggaa 4500
ttttctaag gatagacagt attaatgcag cactctcttc tgctattaaa ctctcattgg 4560
cttctaaaag gagtttcggt gagtgatttg ctgagatgtt tgcattttca tgctgctgcc 4620
tttaggttat tattgcaaca gtttggaatt ttgaaattaa aacagttctg taaaaccagt 4680
ttagttttgt aaagtgtatg catcaaagat gtccttcatt cagacattac tgagttacaa 4740
ctacggtgcc aggtactgtg tcagggtact aggggtatgg ggataaacca gactccctct 4800
ttgatctaaa gcagcatgag gccaggtgag aggtttcaat atatgtgata aaatgtgcac 4860
taggtactaa gggatcatag agaaaggaac acattaaatg gggaacaat tgatagagag 4920
agaatatttt catctgggtc ttaaaagatg agtaggcgtt ctctctcttt aaatgtctga 4980
tataagggca ttttatgcaa agaaggatca ctcgtgcaaa gactcagctt tgcaagaacg 5040
tgaggtattt caggagtttt gtatggttcc atatggacta tgacaagtga gacaggtaaa 5100
ctaggcagag ctggtcatca gataatgaag tcattaacct aaggagattg gacaataaaa 5160
```

```
tgcaatatgg aggtatcgaa gtataaacat aaggagtacc actgatggct gatttaggat 5220
gcccagtctg gcaacacgct aatgaaatga tagtggggga gggggccgta ccaagactag 5280
gagagagcag tcctgagact attgcaatta tctgcgggag acataaaggc tagaacctga 5340
acagtagcag tacaaaaaaa gagggagtt caaatgatat taaggaagta gaagtggtat 5400
gacttaacca tctgggtatg gaaggggaaa tggctagagt cttggggact ttgtgtttga 5460
tgtgattatg gaccacagaa taatgtctaa gagaactggc tctttagtct gactgccaga 5520
gtctgaatcc tgaatgtttt agtatgttac cttgcaaagc ccttagcctc tatgaatcta 5580
tcttcctcat ttataaaaat aagatgacag tgcctatctc gtgggacttt tgtgaggatg 5640
aagtgagata atggatgcaa agttactgag cacagtgtcc aacacagcag aagcattaca 5700
tatacattag ctattactgg ctacattatg atatacagtt agggagttgg aaagataatc 5760
tgaaattcag gagacgtatc tgactatagg tgagtatttg gaactcattg ttctgtaaac 5820
agtagttaca gcacgtgtgt gggcatctgg agagtgagca tggatattgt gatacctagt 5880
acagtgcctg gcagtagtgg ttgtatgctc agtaaatttt gttgacaggg tcaggccgg 5940
actagactgt ggtaagcaag gcctgtaggg cataaatata cttgtatgcc ccgagaagtg 6000
aggacctctt aaatattgtg ccctacatgc cttgttggt tcactcttgt cccagcccta 6060
gcaagtatat ataaggtgaa aaaggaaaaa gctgaggctg gagcctggga gaaccctgga 6120
catttaaggg ccatggagag gaacaggagt taatcaattc aagtgctgga tggataacag 6180
gagttagagc aaagcgggga accagaatag agtgattatt ataaaaagag tttcctaaaa 6240
agggagagat caacaattag aaattattta gagcagccag taaatacata aactcaaaat 6300
tattctttag gtcattcctg attgtgacaa tagtcatttc attatataaa tgtgattaag 6360
gaaggaaaag agctacacag aagttattaa agagctaaag agaattgaga aatttaaaac 6420
agaagaaagt agggccaaca tgaaaggagt agggagaaaa agagataacc agcatattgt 6480
ctcactgatc ctgccaacac ctgtgagata gatattctta ttatactact gttaaaccta 6540
atttacattt gacaaagtta aggttcagag cttgtgtgac ttgtccaagg tcacaggtct 6600
agaggaggca gatacttgat tcaaacctat ttctgtctga tctgattcta aagtctgttt 6660
tttcactcaa ccacactgta cagtcagctc tccttgtgag ttccacagcc acagattcaa 6720
ttaactgcag atcaaaaata ttcaagaaaa aaatggatgg ttcgatctct actgaacatg 6780
tacagactct tttatctttc attattccct aaacaataca gcataacaac tatttacata 6840
gcatttacat tgtattagct attaagagaa acctagagat gatttaaagt acaaggagg 6900
atgtgtttag gttatatgca aatagtaagc catttttata tcggagactt gagcatccac 6960
agatcttgat atttgcaggg ggtcttgcca ccaattttcc atggatactg aggaacgact 7020
gtaaatggat gcaggcatgg atgctatta ggagtgtcca ggccaagta aatgagttgc 7080
tgagcagaga ggtgggtgga ggctgtgagg catcaatatg tggtggcatc catctgcatt 7140
ttggtgattt ttttccttca cagtcctcgg ctgtctggga agagaaggat gaaggcagat 7200
ggctgctcca atttagggc taggattgca gggtgggcac agcattgcaa acgagtgaag 7260
gaaattgaga aatatggcca atgaagagtt gaagagaggc ctggcatggt ggctcacacc 7320
tataatccca gcactttcag aggcccaggc aggcagatca cttgaggtca ggagttcgac 7380
accagcctgg ccaacaaggt gaaatggtga aaccccggct ttactaaaaa tacaaaaatt 7440
agctgggcat ggtggcgggt gcctgtaatc ccagctactt gggaggctga ggcaggagaa 7500
tagcttgaac ctgggagatg gaggttgcag tgagctgaga tcgcaccact gcactccagc 7560
ctgggcgaca gagcaagact ctgtcaaaaa aaaaagagtt gaagagaaaa agtctaggct 7620
aaattcaaag aaaaaagtg agcccaaaag gaacttgcag agcaagggaa aagcagggat 7680
gtcaagggac tagaacactc cataaagtga acagctgcaa tgaaaataag ggaagaaagt 7740
ttagttcatc tccgtttctt tcctttcctt tttactttcc tttctcttcc tttttggagt 7800
tagtcaggaa gtagtcccaa ataccccaga aagttcatct tataagccct tggtcctctt 7860
gagatggtat cagatatatt gctagaccct tgaagaaagg aacaactcca ggcaacttct 7920
tgagtccctg ttattaattt tatacataca cacacatata tgtatataca tgaaaacaca 7980
caaacacatg tgtgtgtata cagccatgca ttccttaaca atggggatat attctgagaa 8040
atgtgtcatt aagcaatttc atcattgtgc gaacataata gagtgtactt acctaaacct 8100
aaatggtata gcttactaca tacctaggtt gtattgatgt ggcctattgc tcctaggctc 8160
ctgggctgca aacctgtaca gcatgtgact gtactgaaca ctgtaggcaa tggtaacagt 8220
ggtatttgtg tatctaaaca tagaaaaggt acagtgaaaa tacagtatta taaccttatg 8280
ggaccactgt cgtataatgt ggtccatcat tgaccaaaat gtcattgtgc agcaaatgat 8340
tatctcatat atatatatat atgatatgat atatatgata tatgtgtg tgtatatatg 8400
tatacatata tatgtgtaca tatatgtata catatataca cacacatata tatgtacaca 8460
catatatgta tatatgtta cacacatata tgtatatata tgtacacaca tatatgtata 8520
tatatgta cacacatata tgtatatata tatgtacaca cacacacata gagagagaga 8580
gagaggagag gagaggaagg agggagggaa ggagaaatat gattcagata gagacatcta 8640
tcctccagag ttcaggagtg tctcttcaga ctaggtagat gtagcttaaa aaaaacatat 8700
cctggaattc tagagagatg cttaaatcac tgcaattcct ataacacttg ccaaccaaag 8760
gtgctgttga tctgaaattg cttttttaaa ttaatgcagt gattttctt taacatctag 8820
```

```
tgacagacac tggggtcaca tttgcagctg gaccataatt aggcttctgt tcttcaggag 8880
acatttgttc aaagtcattt gggcaaccat attctgaaaa cagcccagcc agggtgatgg 8940
atcactttgc aaagatcctc aatgagctat tttcaagtga tgacaaagtg tgaagttaac 9000
cgctcaattt gagttctttc tttttcatcc aaagtaaatt caaatatgat tagaaatctg 9060
accttttatt actggaattc tcttgactaa aagtaaaatt gaattttaat tcctaaatct 9120
ccatgtgtat acagtactgt gggaacatca cagattttgg ctccatgccc taaagagaaa 9180
ttggctttca gattatttgg attaaaaaca aagactttct taagagatgt aaaattttca 9240
tgatgttttc tttttgcta aaactaaaga attattcttt tacatttcag tttttcttga 9300
tcatgaaaac gccaacaaaa ttctgaatcg gccaaagagg tataattcag gtaaattgga 9360
agagtttgtt caagggaacc ttgagagaga atgtatggaa gaaaagtgta gtttttgaaga 9420
agcacgagaa gtttttgaaa acactgaaag aacagtgagt atttccacat aatacccttc 9480
agatgcagag catagaatag aaaatcttta aaagacact tctctttaaa attttaaagc 9540
atccatatat atttatgtat gttaaatgtt ataaaagata ggaaatcaat accaaaacac 9600
tttagatatt accgttaatt tgtcttcttt tattctttat agactgaatt ttggaagcag 9660
tatgttggta agcaattcat tttatcctct agctaatata tgaaacatat gagaattatg 9720
tgggtttttt ctctgcataa atagataata tattaaactt tgtcaaaagg actcagaaag 9780
atcagtccaa ccctctaacc catattggat ggtgatatac tacagggtta tgccagtgtg 9840
ggaactatcg ctggtaaata agtttaatcc tccctagggc ttcacaaaga acattgttcc 9900
accccaggag ggtggaagga agaaactgaa atgattgtgt cttagaacct aatgaaagtt 9960
tgcattcctc agtaaaatca gagactgctg attgacttaa atgtttatag cttcaaagtc 10020
ctcctcatta tcatggccca gaagcccttc catgattgtc cttccccacc ctccccatta 10080
cccttcttgc ctcctctgct acttctctcc tcgcacactg ggctccagcc accctggcct 10140
tcctgtcact tcttgcacac tctaggaatg ctcccacttt ggaggcttta tctggctgtt 10200
tctcttattt ggctgttccc aacttcctgt gggctgactc cctcacctcc ttcgggtctt 10260
tgcccaaatg ttaccatctt aatgaggcct accttcacca tctattaata cttcaacctg 10320
ccccagtagc cttaccactc tagacacctg tacagaactc cactctactt tttaacagag 10380
cttttcacca tctaatgtat catataattt cttactcata ctatttatca tttattttct 10440
cctactccac taaaatgcaa gtttcatgtt ggcagggata ttcaattgtt ttgtttattg 10500
atatattcct agcacctaga acagtatctg gaaaagaggt actcagtaaa tatttatcaa 10560
atgaattgac caaaagaagg aaaactcaaa actttaatga caactaactt taaagctaca 10620
ataacttaaa attcagagta ggattttgag ggagggtaag tttcaaagat tgacttacct 10680
aagactatct gcataaataa aaagaaatta atccagacaa caaattcacc aacttccatc 10740
aattggaaat ccaattctat tttctacagt ttatgttctg gagacatgaga tggacactct 10800
tttactctca taactcataa ctcctccact tttgtttta aatcatgaga gaaaaagagt 10860
tgactctgtt atattgtttt atctaccttt ccttgatctt agaaacgaat actaccatac 10920
cagcttctac tgaggtgccc cctaaagtta gtccaaatag gtctttgcaa tctccattcc 10980
cgcagaattt agaactttga atcacatgat ttatttctaa aagtaaatcc atgccgattt 11040
tccccaccaa aaaattcctg actattaaac tcctacaatc ccttcattgc tcactcccca 11100
cccccaggat catattttaa agttgggccc ttgccttttg ggtcacatag gtacactgtt 11160
tgctatacca caggtatagc tatctggaaa acatggaggg tattattctg ttactactgc 11220
ttcgtcaacc aaaaaataaa acaaaacaag aacaaaaaag aaacaaactc cctgcctctt 11280
ttcacttgca gtcaaggttc ctaaccacta caaaattagc ctatgtttct tcttgcacat 11340
agtagaaacc caagcttctc actgctgtgc tattctgtac catcaactca tcacataaag 11400
agcctggttg aagaatgatt gtccaaccac attactagca tctgtcaaga ctttccagtt 11460
tacaaaaggc ctatcacatt taaccctcac accatccttg tgaccaaagc attattaact 11520
ccattttaca ggagagtaaa ctgaagctta gggaagttaa aagaactgcc aaaggtctcc 11580
cagttgggga gtcatgaagc ccagaagaga agccaaattc tctgctgctc aacccccttgc 11640
tttcactatt acacctcagg gccttcaaat ctaaatgcag ttattcatta aacaggaacc 11700
tggtagtctt aaacaggaat ctctcacttg gtaagatctt gtctcttgtt gtatttgacc 11760
ccaactgtct atggctttgc ctgaacccaa agtacacaca gcctagaaac caaaggagaa 11820
ccaaatgtgg gataaaatga cactcatttt aacgacatgt ctcagcaaat gagttcctgt 11880
gtagctggct gaaagcccag accctttcag taaaacatcc tgaataattc acatttgttg 11940
gtctataata taaagggcaa atgtagctca ttttttagacc agttctgaac atcaatagta 12000
acaaaccaga gataaccgat tttgttttca tagaattgga acaaattaga gtatctgtgc 12060
aaaagcatat cagatctagg agcagagggg acaaggtcta atttttaaat aagcaaattt 12120
tccagggagg gactacttat gataaaggga tattagtctc ttagtcaacg gaacctggat 12180
acacgcttct gacagagaag agggagaata ggcaggaatc tacacaccag atgtcaagga 12240
gatttgcttt aaaatacgac tgataattag aaatttctca gtttccccct tttccctcat 12300
tctttgattc ttattgttat ctttatctct tactcctttg tttctcatat attgagtctt 12360
acagatcaag ctcccatttt tttcttcagg ggtatttttc tagttcaaag tgcctaccat 12420
ctcccttctg gttctattca tccttctctc ccaaagctcc tttagaagtg tggattaagg 12480
```

114

```
cagagcacta agaaaccaga cttaaagatt cccttctcat tctgactttt ctcctttcac 12540
ctattccttc ctcctgtttt cttaccatca gtgtcttcaa aggctttcaa gtacacggta 12600
aatgcagaaa cttcaagaaa ggcagaatgg aaacataacc aatgcataca taaataaagc 12660
acactgtaga atcttttaa attctgtatg atatatcgaa tgctgtctct cacattacct 12720
agaccatttg aaaccgaatt tgtaaaacat agactatctt taagtagtaa cagatgcttc 12780
tgacatgttt tctattgtct tgaaccatta ctgcatatga tacatcaaag ttaagtgaca 12840
atacaagaaa gcagattcat ttgctccctg cctaggccgt cagttcctaa agtggaaacg 12900
ccatatatta tctagctcag tttgctctac aagacctgca atagagcctt gtgtgacata 12960
gagataaatat ttgttgaagc aattaaattt gacttggaat taactctgcc atcattctat 13020
aaggaaggat tgaaaatcct tctcaccctg tgctgatata gtacctttct atacaaaaac 13080
gtccttctcc ctcttccctt ggattgcata aactatgtac atgccttcct caggggcact 13140
tttctaggac agtgtcagcc taaggatctt tgtttgggtg gcttttagaa actcaggaag 13200
acaggagcat catatgccta taggcagctg gcttccaggt cagtagtttt gctctgaccc 13260
taaaatcaga ctcccatccc aatgagtatc tacaggggag gaccgggcat tctaagcagt 13320
ttacgtgcca attcaatttc ttaacctatc tcaaagatgg agatcagtgt gagtccaatc 13380
catgtttaaa tggcggcagt tgcaaggatg acattaattc ctatgaatgt tggtgtccct 13440
ttggatttga aggaaagaac tgtgaattag gtaagtaact attttttgaa tactcatggt 13500
tcaaagtttc cctctgaaac aagttgaaac tggaaaatgc aatattggtg tatcataatt 13560
tttcttaaaa acataccttt gatgcttata aacatttcat ttgtagtgat agttttcagg 13620
atatgagttc aagaagctac attaaaatca ataacaatat ttggtaacta atattaagta 13680
ataatgatgt tccgactcac cttattaatc tttaatacaa ccgtatgtgg ttagtactat 13740
cattatgcgc attctatgca gatgagaaaa ccgcaactcc aacggccaaa aattacagag 13800
gcataaatgg tttagacagg acttaaactt cagtgtgacc aaaacccatg cttctaacta 13860
ctatattcaa aactcagaga aaactgaacc cagaaaattg aaatcatgac taaattgcta 13920
tcaacatagg tgaaagtcaa ttaagtacag aactggagta tgactggcca attatcccat 13980
ataatgggaa ttctccacat gtacaaacca cttcatatgc taaacttgtt gacaacattc 14040
aaagctcatc cctgaatttg actatattga ttacatcgaa aatgttacat agcaacctta 14100
gaatccttgt gtacctttc ttctcaaagc ctagattatt tcttttccg acgttttcag 14160
taattggagc agtaaacccc agtgtccctt acctacttgt ttattacctc cagatgcaat 14220
attactggta ctgtgattga gaaacgcaca cagtgctaat gaggaattca ctttctactc 14280
tgacactctg gaagaataga gatgcaatcc taaggaagaa tttaacacca caggctacat 14340
gactaaggat aaagagtaga aaattagcag gactctatta accgattaca gcaatccacc 14400
tgacagatga aaaaggcatg aaatgaaatg aaatgtagca gctacactcg tcctattgag 14460
aaaggaaaaa agtcacctgt aatgttgttc agaaatcctt tcagtactaa aaaattcatt 14520
gaccatcttc ctttagtctc gaaaatttct tagaaggtaa aaaaaggaaa aggtgacagg 14580
gcaaagacat ttgaaaagaa agaaaagagt gaatgaactt gcacacctgg cttggactcc 14640
ccattcccct taggtttcca ttgtgggggga caaactaatg cctgggttac ctttcttgag 14700
agtgtgttaa ttgattcaat atctctgaag tgctactttc atctgaaagg ttataatttg 14760
aaattcagat ttacctggat aaatttgatc ttgctattat ggaaacctct agaaatcctt 14820
ggagtagtta ctcattatca gcttaaataa tatagccggt ggagctgagg gaatgagtaa 14880
ctcaattagt ctcagttaca actgaagggc acattgttgt aaactataat tgaaaacata 14940
aatatcttta cctagtttaa aaaataaaga tgctttaaaa ggaggaaggg aatagccctg 15000
aggaatgtaa atataagcac aaaacttcta caacagagtt tgctacgtgt gtggctgtgt 15060
tccacccagc aaaaatgcta agtctacaac tgacacaact tggatactct catgttccca 15120
cattttggtt tggtcaaggc tgtgcagttg tactgcaggc caccaccact cctggcctca 15180
acagtatatt gatctgaccc accaatctga tcaaggttta gaaaaatatt ttcagcccag 15240
ttagctcaca aacaaaatga gaattcccac aaattgctct ttatctcaga caacagagga 15300
aagctacagc aaaagcataa acaaattacc atttaagttt gttgcttcaa attaaagact 15360
aattgcaaca gctactagat agcacagttt atgggcatc tcggccccaa gtctttgtc 15420
ttataaggtc ttgaaaaaaa gaaaggagat tttcatcaat aagagttttt tgttatcttt 15480
ttcccttgtt catcaggccc ttcactgcga gagagaggtg taaacgttca gggcatgcat 15540
tctagttaaa gaatattaat tggctattgg gtcccttttgg ttagaataaa gacctctgta 15600
tgatgtccct agctgtacat caaacccaaa tatctctcag ataaatgaag gtctgtaaga 15660
atttggtcat tcctgtctct tctaaagagt aacagaggca tttttcccgca gtaaagtaga 15720
atggaaagaa aacaaaaatc acaagcctat aaacaccttc ttcaattttc ccagcatgtc 15780
acagacacta ctgtcttatt tactacgtat ttctgaggag taaaaaaagg aaatatgttg 15840
agtttagctg aagcacagca tattttgtgg taaacttgtt aaataaaaca tcttttgtcc 15900
aagctttggt tgtcacacaa gtggatatat caggaaatat aaaggcagaa taaactaaag 15960
cagaacatac taacatttgt agtaggcatg aagggaatta gaaagtgttt gtgttaacat 16020
ggagggaggg agaacagatg ctttgagatg ttcttcaaca gatattctag gcactgagac 16080
cccttcggg accagagaga gcccatatcc accacagtac ctgacacata aatgctcagt 16140
```

```
aattgataaa tgagtcccat tctaactgtt ccttagccct gctctatgga actctcccct 16200
gaattccttg tgccattatt ttatttctgg aatcttcagc cttttagctg agggcaaaag 16260
attgctgatt aggaagcaat atttcccacc tcctgcgcaa aacaagccaa agatcaacag 16320
cagcagcaac atactgagcc ctaaagggca atgacaaatg tggagaatga tacagaggtc 16380
tggttacttc ttagccaatg acacagaatc acaattgaga aaacacagag tttattcatt 16440
cccattgtgc atgccctgga caaaccaagc tgcacctttc gtaacttatc acaatctcat 16500
attgacggaa cactttctac aggtaatgtt tgatttggct gaacacttta gcattgcttc 16560
gtagcaacaa aatgatagct agtaacagaa aaagatccag ggatattacc actgttagtg 16620
aggagaaagg ccttttaatt aattaattaa ttaattaata ggaccaagtg ccatcttttt 16680
ggatcatgcc cttagtggat tattggtagc aaaggttaaa gctcaagctg gttcctttgt 16740
ccccctggca acagttgatt tgcctccctt atctcctgaa gtaccgtaag gactaagagc 16800
caattattac atttggctat gctagcatat gtaaaataga gtttaaaagt ttagattcat 16860
cactcaaaaa ttcatattct ccaaaaccat acagtcactc tgttagcctg tgttcccca 16920
gaaaaaaagt cacaagctta ttattaacat gtgcaatcca ggggcaagag aaaggaactg 16980
aagatgaggc agaaaggaaa agaaagccaa taagaggatg agttatcaaa ctactcgttt 17040
cttaacagca actgattgct taacttcctg ggactgtctc caataagtca aattggcctc 17100
aggttagtcc acctgagtgg gaagaagcgg tgaaagaatt tgtctgtcag tatctgtctc 17160
tcattggtta gaagttcgac ttatggggaa ttaactccct cacatttcct agttggatag 17220
cttgggtacc agaggcatat ggcatccatg ctcagcatga acagggaagc ttcaaggcaa 17280
aagacacata gtgcagctat gagccaaggc aattcaagga tacacccata ggaggctggt 17340
tgacatccac ccagagctaa tcaccaccat gctggaaaaa gacacaggtg aagctgagaa 17400
gaatgaaggt ggtgcatagg aggtatctaa tacagtcact cattttcaaa cttttccatgt 17460
tatgattgca ctgaccactg aggatttcta ttgaaagttt tactgttgtc aaacacgtac 17520
acaaggggaa aggtgtctta cattgtttat gttcctgtgc tgctctagaa acagaaatag 17580
gctcaagagc agagcctgtt tttcttaatt cagcaggtct aagctaacaa gtcctgaaac 17640
atggtacttc ctgttattgg tattgcatag gagaaacaaa gggaaagcac agtaattaga 17700
aaatacaaac aagatggcag gaataagcca aaaatatcag gaaacacaat tattgtgaat 17760
tgggattaaa ctaatctatt aataatgaca acttcagct tggagttaaa aatttaattg 17820
tatactgtta acgaaagtga tacctaaaat aaaattacac tgggaggcca aaatgaaggg 17880
atgtgaaaag aactatcagg taaaaactaa caaaagaaa ctagcaaagc aatcttaata 17940
tcagacaaaa tagaatccaa gaggaaaatc atttcaaaag acaagagatt ttttttatta 18000
ataaggggaa ttgcatagga gagtaaagaa aatgtgggcc actggaatgc ttagcactaa 18060
tgacatattg gtctttggtc ttcagttacc ttacaggacc ctatttcatt ctcttatgtt 18120
tgatatgtaa ccacctcagc cagcttcaag ttgctttttg gccctaatgg acttcctagc 18180
actataattt ctttttttt aaatgtttta ttttaggttt aggggtacat gtgaaggttt 18240
gttacataga taaacatgtg tcacaggggt ttgttgtaca tattattaca tgacgcagat 18300
attcagctca gtaccaaata gtgatctttt ctgctcctct gcctcatccc accctcctcc 18360
ctcaagtaga ctccagtatc tgttgtttcc ttctttgtgt ttataagttc ttaacactta 18420
gctcccgctt acaagtgaga acctgcagta tttgattttt gttcctacgc tagtttccta 18480
aggatgatag cctccagctc cattcatatt cccacaaaag acataatctc cttctttct 18540
atggctgcat aatattccat ggtatatatg aaccacattt tctttatcca gtctgtcatt 18600
gatgggcatt taggttgatt ccatgtctgc tattctaaca ctgtaatttc taaagacttc 18660
cagattctac tttttataggt aacctgttaa acagtctagc tctggaagcc aagcaatttc 18720
tagaataact aagcaataga aattacactt caatgcagaa aggcagtatc tacatgagat 18780
tatgaaattg cggttgcttt ttgtgttcac tgaaaaaaat aagtaaaact gtaactttca 18840
gaaaaatga ttgtacatat agaaaaccca aagcatctaa acaattaaaa taaataagta 18900
tagaaagatt actggataca gagtcaacat acaaatatca attgtatgtc tatataccag 18960
caacgattca aaaatgattt ttataatagc attaaaaatt agacgcttag taataaatgt 19020
gagaaagatg tgcaagaact ctacataaaa aattatgaga cgttattgag aaaaattaag 19080
gaaaacctaa ataaatgaat gaataggcaa tgtttatcat taaaggatac aatatagtaa 19140
atatatcaaa tgtttactaa tggattcaat gcaataccaa agtgccagca ggcttttttg 19200
gtggtgggag tcgggcagg attcataagc taattataaa atgcatatgg aaatgcaaag 19260
agccaaggat agccaagaca gttttgagga agaataaact tgtactactt acactaccag 19320
atgtcaagac ttattatcga gttacattta ttaagacagt gtggtactga cacaaggata 19380
gacaaataga tcagtgaaac acactagagt gctcagaagc acacctgtac atatataaag 19440
gcttgattta tgatagaggt gccagtgcag tagagaagga aattattggt gttttcaata 19500
aaaagtgata ggtcaattag atattcatat ggcatgaagt atgaaacaat aacaatttat 19560
attcataact tgcagaaagc aaaaatttct taaaatacaa aaagtgatca ccataaagga 19620
aaagattgat aaactggact atattaaaac taaggactcc tgttcagcaa aagacactac 19680
ttcgactgaa aagacaagtc acagagtgag acaagatatc tgcaatacag atacctaata 19740
actgaacccc atacagtgat ggtgggaatt taagttcgta caatcatttt agaaaattgc 19800
```

```
ttggcagtat ctactagatc tgaacatgtg atccagtaat tacactcata attataagcc 19860
agtaaaaagg catgtttatg tcaccaaaag atatatacaa gaatgttcat tacactatta 19920
tacataagag ccaaaaactg gaaacaaacc aaatatccat taacagtaga atgaataaat 19980
aaaagctgta atagtaatac agtggaatac tacacagcaa tgtaaatgaa ctactgctgt 20040
acaaaacaac atggtttaat ctcacagaca aaatgttaaa tgaaagacac agacgagtac 20100
atattgcgaa cttctgttta taattcaaga actggcaaga actgtttact gtgttagaag 20160
tccaggtaat ggtaacctat aaaaaggaaa aagggtggaa tgattgggag gggcatctt 20220
ctggggtctt gataatgtgc tatgtattgg tcagttagt gtttaaacag gctcatttac 20280
tttgtgaaaa cttacactaa aattgtgtgt attttttgaa tatatgttat acattaataa 20340
atagggtttt taaacctgta gttcataatt tagtgaaagt agaatatcca aacatttagt 20400
tttaaaccaa tcaattatag tgctaccatc attttttatgc attattgaga agtttatttt 20460
accttttcttt ccactcttat ttcaaggctc caaaatttct ctccccaacg tatattgggg 20520
gcaacatgaa tgcccccaat gtatatttga cccatacatg agtcagtagt tccatgtact 20580
ttttagaaat gcatgttaaa tgatgctgtt actgtctatt ttgcttcttt tagatgtaac 20640
atgtaacatt aagaatggca gatgcgagca gttttgtaaa aatagtgctg ataacaaggt 20700
ggtttgctcc tgtactgagg gatatcgact tgcagaaaac cagaagtcct gtgaaccagc 20760
aggtcataat ctgaataaga ttttttaaag aaaatctgta tctgaaactt cagcatttta 20820
acaaacctac ataattttaa ttcctacttg aatctgcttc cttttgaaat catagaaaat 20880
atcagtagct tgaattagac caattaattt tctagattgc atcatatttt aaatataact 20940
atgtaatcat ctacaacctg aattctttct gtgtccaatt tgtccaattt ttttctctaa 21000
catttatatc acaaagcaat taatttgtgt gatttctgca tatgtatttg taattcatca 21060
agtcaaatca atgtagtaat actatatcat aaaatataca caaataattg agtgataggc 21120
ttctagtata aggacggtaa gtttgaagca tgattctatc tgggctggct agtttactct 21180
gagaaagtta ttttttattg ttgggtctta agctgagttt acacacttgg tgtcagaatg 21240
attccggcaa tgaactgttt tatgttctgc taggctgatc agcacaatct atatggctgt 21300
gaacaaaaca atgtttccca gtcataccaa ccatgccacc attttaacag ctgattagtg 21360
tattcagaac atctccactc catgttcgta tggctgttat ctaaagatga aagcagtaga 21420
cacttttatt ttttgaaaaa tttaggctct gcagggtcaa ttatatttga taaatgaggg 21480
gctttttga agcaaactag atataatttc ttttgcattt ctaaagcctg atatcttatt 21540
aattggtaca ttaaattgtg caccatttct ctgtaactgt ttcagtacct gtctcagcac 21600
tataccaggc agaagaaata aagaaagaac cagtgccaga tcagcttggt caggagaccc 21660
taatcctgcg gcactagagg aattaaagac acacacacag aaatatagag tatggagtgg 21720
gaaatcaggg gtctcacagc cttcagagct gagagccccg aacagagatt tacccacata 21780
tttattgaca gcaagccagt cataagattt actgaaagta ttccttatgg gaaataaagg 21840
gatgagtctg gctagttatc tgcagcagga acatgtcctt aaggcacaaa tcacttatgc 21900
aattgtctgt ggtttaagaa cacctttaag cagttttccg ccctgggtgg gccaggtgtt 21960
ccttgccctc attctggtaa acccacaacc ttccagtgtg gatatcaagg ccatcacgag 22020
catatcacag tgctgcagag attttgttta tggccagttt tggggccagt ttatggccag 22080
atttggaggc ctgttcccaa caaaccagaa gctaggaata tatatcctgc aaataaaatg 22140
aagaatctct aaggcttcag ggcctgccca cttgttcttc tgcctggttc ttcacataca 22200
ctgtctcaaa gctagtctac cttgagagga gcatgaatat gtgtgtgggt gtgtgtctgt 22260
gtattttaac cttaaaaacc taacttccag tatagacaga tggcatacta gctaaaccct 22320
tacaagttct tctatgctat aaaagagaaa cagaattgag aaccacctcc aactattaag 22380
tgttatattt gaatatagcc ttagctttag cagataagt aggccaaact taaaataagc 22440
ttttctgcct tttcaatgat aaaggtccct tttctgtagc cattgttgat tgtgtacact 22500
tatacataag tattttgaac taatttcctg ttttctcaac cacttgctgt cttcatgata 22560
ctttgtcgca gctggttgct atagaaatgt ctgttacaag gaatgtggct tgaaggaaag 22620
tgataaatga aaatgaaatg tgaagtgact ttgtttgact acaaattccc attctggtag 22680
tccccagtgt atcaatacat tatttttctt tagaaaataa accaacccaa ggaaaaatgg 22740
tgggcaggtc ctggtgaata tggctgtgat aattatatta gcaatctctt tggctaatat 22800
ttgaagccca ataattgaa tcacaatgat ctctccccag aaaatatata aaatgcacct 22860
tggaatctag aaggcctttt agtctgcaaa agaaaccttc ttaatcataa gcagcagaag 22920
tcccatttac caaattggaa agttaaagtt acaaagcatc aatcatcaga cttccattca 22980
gggatggcaa ttgggagtaa gacttttag taaagaaact aaacacaaag tcattagact 23040
ctgtaaaagt cttaccaaat ttgattctgg aacacctatt ctatttccgt aaagatgatg 23100
aattcggagc caaatgttct tttcatgaag gatttgaaaa ctgtccatga aaataacgca 23160
atcaacctttt tagcttgaga ctctattcac tgattagatt tttttaaata ctgatgggcc 23220
tgcttctcag aagtgacaag gatgggcctc aatctcaatt tttgtaatac atgttccatt 23280
tgccaatgag aaatatcagg ttactaattt ttcttctatt tttctagtgc catttccatg 23340
tggaagagtt tctgtttcac aaacttctaa gctcacccgt gctgaggctg tttttcctga 23400
tgtggactat gtaaattcta ctgaagctga aaccattttg gataacatca ctcaaagcac 23460
```

```
ccaatcattt aatgacttca ctcgggttgt tggtggagaa gatgccaaac caggtcaatt 23520
cccttggcag gtactttata ctgatggtgt gtcaaaactg gagctcagct ggcaagacac 23580
aggccaggtg ggagactgag gctattttac tagacagacc tattgggatg tgagaagtat 23640
ttaggcaagt ttcagcacta accaatgtga gaaggcctcc agagatgagc agttggtgaa 23700
agagaggctc aaaaccagct accatacagg tcaagaagaa tttggcatta aggaaacagc 23760
atagcaggat tccagacagg caactggtca acaacatgaa ggtctggaag aaaggtcgca 23820
gtactcaggt tcagggcact acttcagctt cagcccttgc aaaaactggt gagagttgga 23880
aagtctttag gctaagaaaa attggattat ttaaaagggg taaagaaagg gactcaagga 23940
ggaaggatta aggcaagaac taggttccaa gaaacagggc atgagagaga gtcttgatct 24000
accactatag ttctcgtggt agcatcagaa tcacctggga acgtagaaat gcaaattctc 24060
ctgctctaca ctagacctac caaatcagaa tatctagggg gtggggccca gcagtctgtg 24120
cgcaaacaag cactgcaggt gattttgatg cacattatag tttgaaaact aggccaggtg 24180
cagtggctca tgccaataat cccagcactt tgggagactg agacgggagg attgcttaaa 24240
cccaggagtt tgagaccagc ctgggcaaca cggcgaaacc ccacctctaa ttaaaaaaaa 24300
tacaaaaatt agctaggtgt gatggctccc acctgtgctc ccagctattc aggaggctga 24360
ggtgggagaa tcacctgagc ctggaaagtc gaggctgcag tgaattgtga tcacaccact 24420
gcacttcagc ctgagtgaca gagtaagacc ctatctcaaa aaacagaaaa agaaaaacac 24480
tggcccaaag gaaatgaact tgttacagaa gccggggttc aaaacaccaa ataatgcact 24540
tgtacctagt ccttcccggg tgctctgcag acatttctcc aagcgtagtc tgcaaacaac 24600
ctacatatgt agaattacct atgcacattt ttcatttaac aaccaagagc tacatttgta 24660
gcaaaatctg ggttgtaact tagcctacag ctgaagccta agagattccg tctgtgagaa 24720
gaaataaccc acctctttgg ccccccctccc caggcaggaa gccaggatgg tccttatata 24780
aagttgtgct gtccaatagg taaccactag ccacatatgg ctatttaaat ttaaattaac 24840
tacaattaag agaaattaaa aattcaattc ctcaattgca cctgccaaat tttaagcaca 24900
taacaaccac atgtggctag taactactgt attggagagt gcaagcggag atagaacact 24960
ctattactgc agaaatttct attggatagc acttataata gtttagtgta acttaaaact 25020
ccctagttgc cacagtcatg atttagtagt aatttcatgg atttctctac tgaggttaga 25080
atctctgcca ttagagactg ataaatttaa agtttgcaat tatcaaactg gtgacaattt 25140
aagccagaat caggtaatgt cctcagtttt aacagcattg gaattttctg ggactagctg 25200
tgtatctatc caggattctt gagaatgcct gccattttc aacataatgg atgtaaggta 25260
ttacacatat acctggggat ggggaggtag gtataattgc acaagcattg tggagaatgg 25320
tatcaaagag tggcagaaca tcacaatcaa ggttttccct ttctttacc tttgcttttt 25380
aaaaagacaa tatttgctgg acctgatctt ataactcata aatgggacac tgtatgttcc 25440
tttttacctc ctctgtttct acttaattgc accctatgag gactgcttcc cttacctacc 25500
ataccccctt ccttcactca tccatatctt tactcttctt cacaactctg taatattgac 25560
cttctttatg aacctttcct ggaacaatcc ctcttaatgc aagcactgtt attatgcctt 25620
caatgtattt aatatccatg tatctattct ctctaatttt gtcatttgt gttctcatgt 25680
attttcattc attatgtgtc caacttccat ggataacatg gttacaacaa aagatcctac 25740
tttatgacaa ttatcttcct tgggtttgtg ggacatagaa cagtgcacag agtaggggat 25800
ccaagaaccc aggagaatat attagctaag aagataactt ccgttttaa aagtccaaga 25860
ttcaggagat caaaaccatc ctggctaaca tagtgaaacc ccgtctcttc caaaaataca 25920
aaaaattagc ccggcgtggt ggcaggcgcc tatagtccca gctacacggg aggctgaggc 25980
aggagaatgg cgtgaaccgg ggaggcggag ctggcagtga gccgagatcc cgccactgca 26040
ctccagcctg ggcgacagag cgagactccg tctcaaaaaa aaaaaaaaaa aaaagtcca 26100
agattttaaa aaaaaaaaaa aaaaggatgt ctgctttgtg agtttagcat tgtctccttg 26160
tcattccaga aatgaaatgg caaatacatt taaatcagaa ctaaaaaggg gaacagggta 26220
taaaggctca atttagtcac atcatttccg tttctcaccc accccctttta aaccagatgt 26280
ttgccaatgc attaacaatg cagatgtttc ctgaaagaaa gtttagtaac tcaagcagac 26340
accttatttt cttttcaagc agaaaagact atgagatggt ggttgtggtt gttccgggag 26400
ggagaagata taaatgatac acattatttc aaatcatttc atgacctcac tgcacactta 26460
tagttattgt acctgttgtc tttttgctgt caagcctagc taagatcatt tggaatgttc 26520
aagatcactc atacatgcat gtgcacacat acacatgcac atatgttcac tccctatttc 26580
atccacatga actaagatta ctgatgtgta cagattcaaa gcacttttat tcttttccaa 26640
aggcaagaag ctgagctact ttccagaata gttgtgaaag accctgtcat acttctgcat 26700
tgtttcctcc acaccacctc catccagttc cttatgaatg gttactggtt ttcaaaaata 26760
tgagataaat tgagtgtata aaagtcattt ttagacaaaa tgaaacagga aatgaaagaa 26820
accagaatct ctcctcattt gtggatgggc cagctccacc atgtcatggt taatctgcag 26880
ggaggaaata ctagatttga ttgcagatca gactgcagca aacctgctgt gactaaggca 26940
tcaagagaaa gcaagcaaca gactggggct tcagtggtga aaacattata tatctagctt 27000
tgaaatatga aatactgttt agcagtgtca cctagaaaag agtgtttcaa aatgctgatg 27060
cttcataaga acctttctct tcagagttgg tttctttat ctttcaaatt agccagggtg 27120
```

118

```
ggaaataaag tgatcacttg gtgaagaaat ctcacaaaga agaacataga gagttcactt 27180
tcatctggag taatgaacag attgaacaaa ctagaaatgg ttagtctgtt aaagaaaagg 27240
tgtaggtgag ctgtttgcaa gagccacaag ggaaaggggga agacaacttc tttgtggact 27300
taagggtgaa agttgcaagc aggcaagacg attctgacct ccattaagaa agcccaaacc 27360
aaccaacaac cactgggttg gttacgcagg ttgggcagca ttgggagcaa atgttgattg 27420
aacaaatgtt tgtcggaatt gttgacttaa agagctgttc tgtcactggg gacagcagcg 27480
gctagatagc cccattcagg gagagggcat ttgttcacct ggccagagat cagagcaggc 27540
taagggactg ctgggatcct gtccagcttt gagaccctac agagccatgt tcacctagca 27600
cgtatcccgt ctgcggtcac ggtcatttct taccttattc cagggctttc acctcagctt 27660
gccaggctgg agccaagggc caacgcagcc gcgccttgtt cgcgatggta gcttcccagg 27720
agcccctat ggttccggaa cgcgctgccg gccccatcct gtttgctacc tcctaaagcc 27780
aaaggcactg gcgggccggg ccagcttcta aagtcgcgca aggttagaag gttccggaca 27840
ggaacggcgt gaggccaatg gaaggaggta cttcagtttc cctccagatg cccagcgatg 27900
ggctcagagc tccttgagaa ctcgggaaag gaagcagggt ctctgaagaa atacttcagg 27960
agtagaaaga ggaagctaga gggttaaatg cactacacag gaacagaaat gagtttttct 28020
tagagttagt atatgtctag aggtgtagta aactaaaaca agtcttgaat tgcataccgc 28080
cacgtaggga agaaatgaaa acctttgaat attagtgaaa aaagggaaac tgcaacgcct 28140
gtattactag atagctttca tcaacagctc aaaaccgaca gatttaaaga agcaacaccg 28200
cattttggct ttctaaagct ttaatttggt ttggatccca tgcccatgac cctgccagct 28260
gacaattcta agcatgcgca aactggcccc aaaaattcct cccacatttc cgaagaacta 28320
tttggccctt tatgtgaagt acctggtttt tccattttct gttttaccat aggcctcagt 28380
tcggtgtgtg gcgtatttat tctacattta acaatttgaa gatcattcta ttagattaaa 28440
aaaaaagaat acaatggaag ccaagtgatt aagctttcct tatgcttata ttaagttgta 28500
gcatatgcat ttaccgatag ttaaccgtat taacctacag aaaatgtcca gggaaatggt 28560
ctatttctta ttctattttt gacctaaaga aaatctttaa aatgtcttag cattttcccc 28620
agtctccatc cacttccctc agctttggcc tgaagctatc tttaaaggta ccctgtacaa 28680
gctcttgccc tgtacagcta gctacagaga ttcaatcctt tctgttcgat taggacacat 28740
ctcagtggca gataacatgc aaagttatta tatgtatgaa ccagaacttg tttttcctta 28800
ggggccagga tgttacacta aggtcttaag actatagtaa tatcttcact tgaaaaagcc 28860
ctctattatt cctatctcag atgataaaaa ttcaattaag agaaataaga acgtgacatg 28920
tgtaatcgca cctggctcta caaagctagt ctggacagac atttaaacaa ttatcctcta 28980
agattatttg atgaaatgca tttcaatgac tagttaacca ttaaaaacca aagtgagcat 29040
cccatctgtt cccagtcaaa tgacctagag caaaggacta ggcaaaccac atctgtgggc 29100
atagcaagct gtacatcaca aacaaatgaa tttgctttgt atatgagtga gagcaaacac 29160
tctttattgt acaacttggg tgggtaagta gggagaataa tggtttttact gaaatcgcag 29220
gtaacggtta cgttggagtt aaaggttagg aagaaaacca aagggtaaga gctgttgttc 29280
tgggctggca ttgtcaatga agagcataaa ttcagatgtg aatgtatatt ttgtagaagc 29340
atgtgtgttg ttggtttttg tgtatgtgtg agtctgaaag agggaaaaca ggctcccatt 29400
agactatgac taacaaaaat gtttgacaga ttataactca gatgtcttac tcagagcata 29460
tgccttccca ttttccccat tattccccaa catgatgtct ttaagaactt gtccttgacc 29520
gagcagacat ctcataccccc aaatagctaa tattttgata gctatgatcc tgaacggcca 29580
aacattccaa aaccaagtag tttgtaatat ctttaatgca aatatatttt aggccttttc 29640
cttggcaagg atgtttggtc aggggttggc aaaaataatg ctcttcagac ttaaaagaac 29700
acaaccatat ttcttagcca tccaccagaa agtagtagaa cgctccagga agcaagtctt 29760
tgtcaggagt cagactagct acatcataat ctctctgccc aggggctgtg gatgtcatcc 29820
atcctggcct aactagccta ctgagctgag agatgtccaa tttccccca atacactaac 29880
cagaggagaa ggaccgtgat atcattgcagt gtgaattctt aattccaatt gcttaaacaa 29940
atatgttcag ttgtaactat caataccagt atataacagt gttggccaag ttttattgat 30000
gctgacaatc aattggagtt acagccagac acatggtctt atgaccggcg tacttacgca 30060
gggctttgca ctgagacagg tcgtgcatct gaggtttact gctttgcatt tttgtttttgt 30120
aactgaagtc tgatgagaca gccagagcat gtgctaccta gggacttgaa tccctgcagc 30180
cccatttcac ttctcaccac cttccggggt ggtttctcga cctcccactc ccctaccacc 30240
tggtgcctta gccagccctg gctctccctc caaacacctg cccaatgagc actgccaccc 30300
catggtgccc agacatgctc tccctcctca tccctaccta gctaccattg ccactcccct 30360
cccccagcgg ggacatgggc ataggagcag ggagagttaa ggttggtcag gtgcacgtgc 30420
cctatgctat cttggaaggg ggcttggcca tgtggcatct ctggaccaag aatgcgccac 30480
agcacatttg gagggtgaat ggtgggggca caccccttgt ccacctctat ttcaggcatg 30540
gaacacatcc tggcatgaaa gttgcagtcc cttgggaatc acctctccac cttgattgcc 30600
acagtaggcc agtgacaagg gaagattgac acatcatccc tgctgggggcc cagtgtcctg 30660
tggctggcag gcaggggatc ctaaggacat gtgggtctta aattgtaggg tgcacttcct 30720
gggcaccttt gagggtctgc actgccccag caaatatccc catgctagaa ggagcaaaat 30780
```

```
attaaatggc aaattttaaa aatgtaacaa gatgggttgc aaaagagact acagaggaaa 30840
gcaaaagttt tgtattttag tatcttccat ggcacttttc ttcctagctt ttgaacaagg 30900
ggccccacat ttttatttct cactgagccc cacaaagtat gtagccattc ctgcccggag 30960
tgaggacttt taaaacataa agattatcaa gtcttggaaa ttctgattca gtagatatat 31020
aacaggtctc aaacttaatt atgtaaagaa tattctggag agcttccttt tacccagtcc 31080
cacccaccaa atattctgat aaattaagct tcgattagcc cccagatctg cattttataa 31140
ggatccccag atgattctac tgcaattggt ccacagacca tgcctggacc gaatttgggt 31200
gcttaggagc acaaattctg gagccgggca gacttgagtt tgcttcctag ctttaccaac 31260
tgatctcagg ggagttaatg tttacctcta aactttagct catgcatcta taaataaata 31320
tattaatatc atgtcataag gatattatgt tgtattaaat gtctttaaaa caccacaatg 31380
attagcccaa agtaaacact caataaatgt tcaaaaattt aggaaaattg ttaagactgg 31440
gttgtatgca cactggtgtt tattatatta tgtagttttt tctgtatttt tacaacattt 31500
cagaattaaa agcaacagct agaaaaagag ggaaatggcc gggtgcagtc gtcacgcctg 31560
taatcccagc actttgggag gccaaggcgg gcggatcacg aggtcgagag atcgagacca 31620
tcctggccaa catggtgaaa ccccatctct actaaaaata caaaaattaa ctgggcatgg 31680
tggcatgcgc ctgtagtccc aggagaattg cttgaacctg ggaggcggag gttgcagtga 31740
gccaagatct caccactgct ctccagcctg gtgacagggc aagactccgt caaaaaaaaa 31800
aaagagaggg agagccagag tatgaaaaag gaagtcagag ccctttaatg agtcagcttt 31860
gtaggtctcc aggtaggagg ctagtgcttc agtgtctagg acatagtagg tgttcagtaa 31920
attaaattca ggacaaaaag aacatgcccc aaggaccatc tgatatccac ttaaagtgat 31980
ggactacctc gtttcccttg tttatgaatg ggttcatgcc taagactgtg tgcactttaa 32040
tacaagggca gtcgttcaga actagtcagg tcctgaaaag gatttaccaa atgttgagtg 32100
tgccctctag tgttcacact tcccagcttt cttcctataa aggtggatca aggcacttgc 32160
ttacaactgg aactgaaatc ctccaagtcg atctagacat tgagatggag aaaatattca 32220
ttgtcgactg taattatgca acgaatatcc agttgagata atggacttgc ctcttatcta 32280
ataatcccca ggctcaatgc gtcactgctt tgtccacttt gcccaaaatt caagcacagc 32340
taagttgata tttttaggaca aaggcagctt actatccagc cagaggggag tagaatatgg 32400
ttaagagaga gtggaaagaa tgaatgagcc ctgctattcc tcactgcctg gatggctata 32460
agcacagccc ttatggaggc cttaggtctt gcttacaat attccagttt gaaaagggtt 32520
tgaaaagacc tcctagaaaa atcagtagtt tttctctttt gagtaacatg tagcaaaaaa 32580
aatttcatca tgtaggtaca gggaacaccc tagtaactat taatctcaag gagtcaagcc 32640
agtgtgtttc ctaatgtatc tgctgtatcc ccatgaagca aattttgcca tcagagaaac 32700
tgactcatgg ggaaaaaatc caaggacctc aaatcaccaa aagaagccat tcctcagatt 32760
tgcctaagct taagcttccc tgtctctcat tgtgtgttgc tttcaatgca gttacataaa 32820
tggcttttt gtttatgcac caaaaacact aattcatctg caaagctcac atttccagaa 32880
acattccatt tctgccagca cctagaagcc aatattttgc ctattcctgt aaccagcaca 32940
catatttatt tttttctaga tcaaatgtat tatgcagtaa gagtcttaat tttgttttca 33000
caggttgttt tgaatggtaa agttgatgca ttctgtggag gctctatcgt taatgaaaaa 33060
tggattgtaa ctgctgccca ctgtgttgaa actggtgtta aaattacagt tgtcgcaggt 33120
aaatacacag aaagaataat aatctgcagc accactagct ctttaatatg attggtacac 33180
catattttac taaggtctaa taaaattgtt gttgaataaa ttgggctaaa ggcagaaggg 33240
tcataatttc agaaccacg tcgcaccgtc ctccaagcat ccatagttct tttgatatac 33300
ccctattatc actcatttca gtgaggtaca attagttctt gatgtagcca tttccatacc 33360
agaaggcctt cccaaaaatc agtgtcatgt caccgatcct tttatctctg tgtcttggca 33420
caacctgtag caggtcctca gaaaacaaac atttgaatta atggccaaat gagtttgtgc 33480
tcaaaaaagg ggtgaggata cttgaaattt ggaaaatcta ggataattca tgactagtgg 33540
attcattatc accaatgaaa ggcttataac agcatgagtg aacagaacca tctctatgat 33600
agtcctgaat ggcttttttgg tctgaaaaat atgcattggc tctcattaca tttaaccaaa 33660
attatcacaa tataagaatg agatctttaa cattgccaat taggtcagtg gtcccaagta 33720
gtcacttaga aaatctgtgt atgtgaaata ctgtttgtga cttaaaatga aatttatttt 33780
taataggtga acataatatt gaggagacag aacatacaga gcaaaagcga aatgtgattc 33840
gaattattcc tcaccacaac tacaatgcag ctattaataa gtacaaccat gacattgccc 33900
ttctggaact ggacgaaccc ttagtgctaa acagctacgt tacacctatt tgcattgctg 33960
acaaggaata cacgaacatc ttcctcaaat ttggatctgg ctatgtaagt ggctggggaa 34020
gagtcttcca caaagggaga tcagctttag ttcttcagta ccttagagtt ccacttgttg 34080
accgagccac atgtcttcga tctacaaagt tcaccatcta taacaacatg ttctgtgctg 34140
gcttccatga aggaggtaga gattcatgtc aaggagatag tggggggaccc catgttactg 34200
aagtggaagg gaccagtttc ttaactggaa ttattagctg gggtgaagag tgtgcaatga 34260
aaggcaaata tggaatatat accaaggtat cccggtatgt caactggatt aaggaaaaaa 34320
caaagctcac ttaatgaaag atggatttcc aaggttaatt cattggaatt gaaaattaac 34380
agggcctctc actaactaat cactttccca tcttttgtta gatttgaata tatacattct 34440
```

120

```
atgatcattg cttttttctct ttacagggga gaatttcata ttttacctga gcaaattgat 34500
tagaaaatgg aaccactaga ggaatataat gtgttaggaa attacagtca tttctaaggg 34560
cccagccctt gacaaaattg tgaagttaaa ttctccactc tgtccatcag atactatggt 34620
tctccactat ggcaactaac tcactcaatt ttccctcctt agcagcattc catcttcccg 34680
atcttctttg cttctccaac caaaacatca atgtttatta gttctgtata cagtacagga 34740
tctttggtct actctatcac aaggccagta ccacactcat gaagaaagaa cacaggagta 34800
gctgagaggc taaaactcat caaaaacact actccttttc ctctacccta ttcctcaatc 34860
ttttaccttt tccaaatccc aatccccaaa tcagtttttc tctttcttac tccctctctc 34920
ccttttaccc tccatggtcg ttaaaggaga gatggggagc atcattctgt tatacttctg 34980
tacacagtta tacatgtcta tcaaacccag acttgcttcc atagtggaga cttgcttttc 35040
agaacatagg gatgaagtaa ggtgcctgaa aagtttgggg gaaaagtttc tttcagagag 35100
ttaagttatt ttatatatat aaatatatata taaaatatat aatatacaat ataaatatat 35160
agtgtgtgtg tgtatgcgtg tgtgtagaca cacacgcata cacacatata atggaagcaa 35220
taagccattc taagagcttg tatggttatg gaggtctgac taggcatgat ttcacgaagg 35280
caagattggc atatcattgt aactaaaaaa gctgacattg acccagacat attgtactct 35340
ttctaaaaat aataataata atgctaacag aaagaagaga accgttcgtt tgcaatctac 35400
agctagtaga gactttgagg aagaattcaa cagtgtgtct tcagcagtgt tcagagccaa 35460
gcaagaagtt gaagttgcct agaccagagg acataagtat catgtctcct ttaactagca 35520
tacccccgaag tggagaaggg tgcagcaggc tcaaaggcat aagtcattcc aatcagccaa 35580
ctaagttgtc ctttttctggt ttcgtgttca ccatggaaca ttttgattat agttaatcct 35640
tctatcttga atcttctaga gagttgctga ccaactgacg tatgtttccc tttgtgaatt 35700
aataaactgg tgttctggtt cataccttgg ctttttgtgg attccattga tgtgaatcag 35760
tcaccctgta tttgatgatg catgggacta ctgacaaaat cactctgacc ctgccaagct 35820
gctgccttct cctgccccaa cctcacccccc agccaggcct cactcttgct agttcctta 35880
gttcttttag tcaatatatt tttgtcttcg catataagta taaataaaca tatttttaaa 35940
tttcttggct gggcccagtg gctcacgcct ataatcccag cacttctgga ggccaaggtg 36000
ggcggatcac ctgaggttag gagtttcagg ccagcctggc caacatggtg aaaccctgtc 36060
tctactaaaa atagaacaat tagctgggct tggtaatgtg cacctataat cccagctact 36120
ggggaggctg aggcaggaga atcacttgag cctggggagc aggggtgcg ggaggttgca 36180
gtgagacaag atcgcaccag tgcactcccc atcctgggtg acagagtgag actctgtctc 36240
aaagaaaata aataaataaa tacatttctt gaggcgtttc ttgttaaatc attcatggag 36300
aggcatccca aacaccacat tcaacaaaac actctgaaaa atgttttcaa atgcaatata 36360
acacagcaga gatttgatgc tctgttatcc agttttcata taaggctgtg tgagctgtgt 36420
cccagagagg acagtggtct gaatccacct gagacagaat tgggtctaac taactgtgag 36480
tatggccttc aataagtcac tctccatttg ggaatttgat ttctccactt gtataatgag 36540
agtatttgac aggatgctct cccaaatccc ttgcaatttt gttagtctgt gatttcatgt 36600
ttttatttttt attccttcat ccaacaaata gtcaaggagt aattgctgtg tgccaaatac 36660
caacagtatt cattaaattg taattcagat tttatatata tataaataat gtataatgtg 36720
tataaattgc tttgtgagtg cctactacac tgctagacag tagttgctca ataacttgtt 36780
agctgaatca gaatccatgt ttatcccaga gtagcaatta gtcttgcatc gagtatcgtg 36840
aaagaaggcc acacttaaat aagaataatg cctggggttt aggttttatg aaaaaatgaa 36900
aggaaattag ttctgctttt gttgactaaa ggaagggaag agagaagaga cactataatt 36960
gtctgcctca gatttaagga ggaggctaat tcatgcatta aacacgttac ttcaaatttg 37020
aatgaccaaa ggtctgtagc ctcagcactt caaaattggt aaaagtaaga cactctggcc 37080
ttgtttccat agagaccacc ccttacaaag gcaccaatgg gaaactggcc tcaggactcc 37140
tgttattggt cttctctgtg gcagagaaag gagctcttgg acccataaat ctctgagcca 37200
cagttctttt tgccatgggc tcaaaaatga ttgaattcat catgagccac ctgtggcata 37260
ttgccacact aaacatgtgg ggcctttaag ctcactaaga gccaatgtct tcagagccag 37320
ccctggcttg attctaccta gggcatttgc agttgccata taagaatcat tagtgctttc 37380
aaaattactg tagatacttt gcctaaatag actaaaaacat gctgccgtca tattggaagt 37440
gacagattaa aatagaactc ttgccaagtg aaggaaagtg tgctaatata atgcagtcat 37500
tttaacttgc tgtttaagtg tgattgtttt tagttctttt gaatattatt tgttttatac 37560
tgacaggaac gaagtactgt ccaattttct ctgccaagga aaaaagaaaa ggtgttcttc 37620
cttacttacc tgaaccaaaa cagaccagtt tacaaaattg cctaattata attgctaaac 37680
aagttccgaa tgcttacagt ctaatccaag aatgtcagag ctgcaagggc ccttaaacac 37740
catccaatcc actccactca tttagcagat gaagagattg agggcaacat aaggccaggc 37800
ccaagataac acaatgacag ccaggactag agctcaagtc tcccacccctg cactttgaaa 37860
gaataatgct ttcaactgga gtacattaac tctactgtct atattttttag ggcagctggg 37920
gcattctgca ttggtggcaa tcctctcaac aaccctggga ctgaaaactg cctggaattc 37980
ttactaacaa ttctctaatt gaccaaaagg tgacgaaatc aaggagacca ataaggtagc 38040
cttggaaagc aagagtggc                                              38059
```

```
<210> 103
<211> 1855
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. J05428

<400> 103
tgcattgcac caggatgtct gtgaaatgga cttcagtaat tttgctaata caactgagct 60
tttgctttag ctctgggaat tgtggaaagg tgctggtgtg ggcagcagaa tacagccatt 120
ggatgaatat aaagacaatc ctggatgagc ttattcagag aggtcatgag gtgactgtac 180
tggcatcttc agcttccatt ctttttgatc ccaacaactc atccgctctt aaaattgaaa 240
tttatcccac atctttaact aaaactgagt tggagaattt catcatgcaa cagattaaga 300
gatggtcaga ccttccaaaa gatacatttt ggttatattt ttcacaagta caggaaatca 360
tgtcaatatt tggtgacata actagaaagt tctgtaaaga tgtagtttca aataagaaat 420
ttatgaaaaa agtacaagag tcaagatttg acgtcatttt tgcagatgct attttttccct 480
gtagtgagct gctggctgag ctatttaaca tacccttgt gtacagtctc agcttctctc 540
ctggctacac ttttgaaaag catagtggag gatttatttt ccctccttcc tacgtacctg 600
ttgttatgtc agaattaact gatcaaatga ctttcatgga gagggtaaaa aatatgatct 660
atgtgctttta ctttgacttt tggttcgaaa tatttgacat gaagaagtgg gatcagtttt 720
atagtgaagt tctaggaaga cccactacgt tatctgagac aatggggaaa gctgacgtat 780
ggcttattcg aaactcctgg aatttcagt ttcctcatcc actcttacca aatgttgatt 840
ttgttggagg actccactgc aaacctgcca aacccctgcc taaggaaatg gaagactttg 900
tacagagctc tggagaaaat ggtgttgtgg tgttttctct ggggtcaatg gtcagtaaca 960
tgacagaaga aagggccaac gtaattgcat cagccctggc ccagatccca caaaaggttc 1020
tgtggagatt tgatgggaat aaaccagata ccttaggtct caatactcgg ctgtataagt 1080
ggatacccca gaatgacctt ctaggtcatc caaagaccag agcttttata actcatggtg 1140
gagccaatgg catctacgag gcaatctacc atgggatccc tatggtgggg attccattgt 1200
ttgccgatca acctgataac attgctcaca tgaaggccag gggagcagct gttagagtgg 1260
acttcaacac aatgtcgagt acagacttgc tgaatgcatt gaagagagta attaatgatc 1320
cttcatataa agagaatgtt atgaaattat caagaattca acatgatcaa ccagtgaagc 1380
ccctggatcg agcagtcttc tggattgaat ttgtcatgcg ccacaaagga gctaaacacc 1440
ttcgggttgc agcccacgac ctcacctggt tccagtacca ctctttggat gtgattgggt 1500
tcctgctggt ctgtgtggca actgtgatat ttatcgtcac aaaatgttgt ctgtttttgtt 1560
tctggaagtt tgctagaaaa gcaaagaagg gaaaaaatga ttagttatat ctgagatttg 1620
aagctggaaa acctgatagg tgagactact tcagtttatt ccagcaagaa agattgtgat 1680
gcaagatttc tttcttcctg agacaaaaaa aaaaaaaaga aaaaaaaatc ttttcaaaat 1740
ttactttgtc aaataaaaat ttgttttttca gagatttacc acccagttca tggttagaaa 1800
tattttgtgg caatgaagaa aacactacgg aaaataaaaa ataagataaa gcctt 1855
```

```
<210> 104
<211> 547
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. AI819354

<400> 104
ttttatgttt agtttaagaa ttttatttta aaggaatttc tgtggcataa cataaggttt 60
atggtacttt tactaaaagt cacttataat gaccaaatta taacaatttt tgcaataagc 120
tctcattaaa ttttcctaaa agtagaaaaa gtacacatta tataccattt tgcacttaat 180
tacttcttta aaatctcaaa ataattcagt gtaaatgtt agtttcaaag acaatttatg 240
ggaaattaca aagcaactac aaagttcttc ataataaatc caagataaaa gtaacttttt 300
acaggttgaa agttttttcaa aatgcctaag tggattataa atacagtttg gccatctgat 360
gaatttagag gcactttaaa aggtgtctag ttgaactact acagatagga catgtttgag 420
gaaatttaat ctttaagtct aataccagtg ttcatttctt cctgccaaaa caagaaattt 480
attggaaaaa tccatgagca gcatgattag tttgatttct ttctctttt ttagagacag 540
ggtcttg 547
```

<210> 105
<211> 2282
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. L32140

<400> 105
```
ccccgagtct ctgcgccttc acatagttgt cacaggacta aagcaaattg atccaggggg 60
aaacactgta gaccgtgtat ataaaaacac tctataaact gcaatgctca attcttagta 120
taactattgt tgttgtattg atatttatta gtattggtgc tcacaaaaag agtctaaatt 180
ccataagtct ttatattcag gctactcttt attttttgaaa actcattttc tatcacccttt 240
ttctattta ctccatattg aggcctcata aatccaattt tttatttctt tcttttgtaa 300
atgtggtttc tacaaagatg aaactactaa aacttacagg ttttatttt ttcttgtttt 360
ttttgactga atccctaacc ctgcccacac aacctcggga tatagagaac ttcaatagta 420
ctcaaaaatt tatagaagat aatattgaat acatcaccat cattgcattt gctcagtatg 480
ttcaggaagc aacctttgaa gaaatggaaa agctggtgaa agacatggta gaatacaaag 540
acagatgtat ggctgacaag acgctcccag agtgttcaaa attacctaat aatgttttac 600
aggaaaaaat atgtgctatg gaggggctgc cacaaaagca taatttctca cactgctgca 660
gtaaggttga tgctcaaaga agactctgtt tcttctataa caagaaatct gatgtgggat 720
ttctgcctcc tttccctacc ctggatcccg aagagaaatg ccaggcttat gaaagtaaca 780
gagaatccct tttaaatcac ttttttatatg aagttgccag aaggaaccca tttgtcttcg 840
cccctacact tctaactgtt gctgttcatt ttgaggaggt ggccaaatca tgttgtgaag 900
aacaaaacaa agtcaactgc cttcaaacaa gggcaatacc tgtcacacaa tatttaaaag 960
cattttcttc ttatcaaaaa catgtctgtg gggcactttt gaaatttgga accaaagttg 1020
tacacttttat atatattgcg atactcagtc aaaaattccc caagattgaa tttaaggagc 1080
ttatttctct tgtagaagat gtttcttcca actatgatgg atgctgtgaa ggggatgttg 1140
tgcagtgcat ccgtgacacg agcaaggtta tgaaccatat ttgttcaaaa caagattcta 1200
tctccagcaa aatcaaagag tgctgtgaaa agaaaatacc agagcgcggc cagtgtgataa 1260
ttaactcaaa caaagatgat agaccaaagg atttatctct aagagaagga aaatttactg 1320
acagtgaaaa tgtgtgtcaa gaacgagatg ctgacccaga caccttcttt gcgaagttta 1380
cttttgaata ctcaaggaga catccagacc tgtctatacc agagcttta agaattgttc 1440
aaatatacaa agatctcctg agaaattgct gcaacacaga aaaccctcca ggttgttacc 1500
gttacgcgga agacaaattc aatgagacaa ctgagaaaag cctcaagatg gtacaacaag 1560
aatgtaaaca tttccagaat ttggggaagg atggtttgaa ataccattac ctcatcaggc 1620
tcacgaagat agctccccaa ctctccactg aagaactggt gtctcttggc gagaaaatgg 1680
tgacagcttt cactacttgc tgtacgctaa gtgaagagtt tgcctgtgtt gataatttgg 1740
cagatttagt ttttggagag ttatgtggag taaatgaaaa tcgaactatc aaccctgctg 1800
tggaccactg ctgtaaaaca aactttgcct tcagaaggcc ctgctttgag agtttgaaag 1860
ctgataaaac atatgtgcct ccaccttttct ctcaagattt atttaccttt cacgcagaca 1920
tgtgtcaatc tcagaatgag gagcttcaga ggaagacaga caggtttctt gtcaacttag 1980
tgaagctgaa gcatgaactc acagatgaag agctgcagtc tttgtttaca aatttcgcaa 2040
atgtagtgga taagtgctgc aaagcagaga gtcctgaagt ctgctttaat gaagagagtc 2100
caaaaattgg caactgaagc cagctgctgg agatatgtaa agaaaaaagc accaaaggga 2160
aggcttccta tctgtgtggt gatgaatcgc atttcctgag aacaaaataa aaggattttt 2220
ctgtaactgt cacctgaaat aatacattgc agcaagcaat aaacacaaca ttttgtaaag 2280
tt                                                                2282
```

<210> 106
<211> 1935
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. M10943

<400> 106
```
tctagacagt ggcgcaagag actggggttg cactgggact ccaggaaagg cttagctgtt 60
gacgaaggac cggggcgggg ccggggggcg gggcgaaggc caggatctcc aggtacccgg 120
```

```
aaccccaagg ggcgggtgta gcaggcaatc ttggcgaaac tgggaagggc gggcaggagg 180
gcagggaagc cgctcaccca ggcacaaagc gcctcccgct tgagcggact ccaaagggac 240
ggtccgcggt gtgcagcgag ctgcgctcag gggaccttgc gcccggccct tctgctgcac 300
acagcccacc caggacctcc cgcagcgctg acaggcgggg cgggtgcaaa gacggggcgg 360
ggtctctgcg cccggccccc tcccctgact atcaaagcag cggccggctg tttgggtcca 420
ccacgccttc cacctgcccc actgcttctt cgcttctctc ttggaaagtc cagtctctcc 480
tcggcttgca atggacccca actgctcctg cgccgctggt aaggaacgcc gggttccgtg 540
cctggggatg ctcgattccc agacaccata gagagtgttc ctgggtttga gaaggtcgta 600
ttttgagatc tcaactgtag gggactcctt gacttagtcc agtgctttcc tcttggccaa 660
gatcctgaga gcatttcctt cctctctgtg cctctgtgtc agcgttgagg gtactgaggc 720
tcaaggctgt cctgctccac gtcatgcggt ttgtcccagg gctgttggct gagccccagt 780
gctctgacca ggctttgagc agcaggatta dataggaggc aggggacatt gcctcttcgg 840
ggttcaggac agaaagtcga agtcgccgtc ttcccaggct gtgcctggag cctgggactt 900
tcctttggag tgcaaacagg aggctgcttg gccttcccag catgaaggga gaggacatgg 960
ggcttctctt cctctgctct gagtgggaaa ggagctctga gggctggccc cgcacagagg 1020
aggggcaat ggagactcat taactcactg ctgtacctcc tgcaggtcac tcgccgctca 1080
ctggcttttt tttctctttc tcgcaggtgt ctcctgcacc tgcgctggtt cctgcaagtg 1140
caaagagtgc aaatgcacct cctgcaagaa gagtgagtgt gaggccatct ccatggtctg 1200
gggctgtggc taaggttggg atggaaccca aggctggccc tgagtgcatg cttctgggga 1260
actggccttc ctttgtcccc gtaggttgtc actgcctttc tagtcttctg ccctgtgcag 1320
ggcgcctggg cagctttctc ataggaagac ccaccccaga tatttcccag ttgtctcctg 1380
acaaagccat accctcctga actgagggtc ctttgtggct ggaggctctg ttgggggcct 1440
ctgttggggga gggaggtccc tgggcaagtt ggctgtgacc tctcatgctc ctcttcttcc 1500
ccaggctgct gctcctgctg ccccgtgggc tgtagcaagt gtgcccaggg ctgtgtttgc 1560
aaaggggcgt cagagaagtg cagctgctgc gactgatgcc aggacaacct ttctcccaga 1620
tgtaaacaga gagacatgta caaacctgga tttttttttt ataccacctt gacccatttg 1680
ctacattcct tttcctgtga aatatgtgag tgataattaa acactttaga cctgattctg 1740
acttcagttt cccttatgtg cttcagaaat cagagactgg ggtggggggat cgaactaggg 1800
ttgcagactc ctgggctcta aatggaaatc tgagtcccta acaatcagag tgcattaagg 1860
caagccaggc tgcctcactg tgcttcctct tctgtagaat ggaataacac ttcatcaggt 1920
cattggtggg gatcc                                                1935
```

```
<210> 107
<211> 2532
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. X03350

<400> 107
agtgcactca agcagagaag aaatccacaa agactcacca gtctgctggt gggcagagaa 60
gacagaaacg acatgagcac agcaggaaaa gtaatcaaat gcaaagcagc tgtgctatgg 120
gaggtaaaga aacccttttc cattgaggat gtggaggttg cacctcctaa ggcttatgaa 180
gttcgcatta agatggtggc tgtaggaatc tgtcgcacag atgaccacgt ggttagtggc 240
aacctggtga cccccccttcc tgtgatttta ggccatgagg cagccggcat cgtggagagt 300
gttggagaag gggtgactac agtcaaacca ggtgataaag tcatcccgct ctttactcct 360
cagtgtggaa aatgcagagt ttgtaaaaac ccggagagca actactgctt gaaaaatgat 420
ctaggcaatc ctcgggggac cctgcaggat ggcaccagga ggttcacctg caggggaag 480
cccattcacc acttccttgg caccagcacc ttctcccagt acacggtggt ggatgagaat 540
gcagtggcca aaattgatgc agcctcgccc ctggagaaag tctgcctcat tggctgtgga 600
ttctcgactg gttatgggtc tgcagttaac gttgccaagg tcaccccagg ctctacctgt 660
gctgtgtttg gcctgggagg ggtcggccta tctgctgtta tgggctgtaa agcagctgga 720
gcagccagaa tcattgcggt ggacatcaac aaggacaaat ttgcaaaggc caaagagttg 780
ggtgccactg aatgcatcaa ccctcaagac tacaagaaac ccatccagga agtgctaaag 840
gaaatgactg atggaggtgt ggattttttcg tttgaagtca tcggtcggct tgacaccatg 900
atggcttccc tgttatgttg tcatgaggca tgtggcacaa gcgtcatcgt aggggtacct 960
cctgcttccc agaacctctc aataaaccct atgctgctac tgactggacg cacctggaag 1020
ggggctgttt atggtggctt taagagtaaa gaaggtatcc caaaacttgt ggctgatttt 1080
atggctaaga gtttttcact ggatgcgtta ataacccatg ttttacctttt tgaaaaaata 1140
aatgaaggat ttgacctgct tcactctggg aaaagtatcc gtaccgtcct gacgtttttga 1200
```

```
ggcaatagag atgccttccc ctgtagcagt cttcagcctc ctctacccta cgagatctgg 1260
agcaacagct aggaaatatc attaattcag ctcttcagag atgttatcaa taaattacac 1320
atgggggctt tccaaagaaa tggaaattga tgggaaatta tttttcagga aaatttaaaa 1380
ttcaagtcag aagtaaataa agtgttgaac atcagctggg gaattgaagc caacaaacct 1440
tccttcttaa ccattctact gtgtcacctt tgccattgag gaaaaatatt cctgtgactt 1500
cttgcatttt tggtatcttc ataatcttta gtcatcgaat cccagtggag gggacccttt 1560
tacttgccct gaacatacac atgctgggcc attgtgattg aagtcttcta actctgtctc 1620
agttttcact gtcgacattt tccttttct aataaaaatg taccaaatcc ctggggtaaa 1680
agctagggta aggtaaagga tagactcaca tttacaagta gtgaaggtcc aagagttcta 1740
aatacaggaa atttcttagg aactcaaata aaatgcccac attttactac agtaaatggc 1800
agtgtttta tgactttat actatttctt tatggtcgat atacaattga ttttttaaaa 1860
taatagcaga tttcttgctt catatgacaa agcctcaatt actaattgta aaaactgaac 1920
tattcccaga atcatgttca aaaaatctgt aattttgctg atgaaagtgc ttcattgact 1980
aaacagtatt agtttgtggc tataaatgat tatttaggat gatgactgaa aatgtgtata 2040
agtaattaaa agtaatatgg tggctttaag tgtagagatg ggatggcaaa tgctgtgaat 2100
gcagaatgta aaattggtaa ctaagaaatg gcacaaacac cttaagcaat atatttcct 2160
agtagatata tatatacaca tacatatata cacatataca aatgtatatt tttgcaaaat 2220
tgttttcaat ctagaacttt tctattaact accatgtctt aaaatcaagt ctataatcct 2280
agcattagtt taatattttg aatatgtaaa gacctgtgtt aatgctttgt taatgctttt 2340
cccactctca tttgttaatg ctttcccact ctcaggggaa ggatttgcat tttgagcttt 2400
atctctaaat gtgacatgca aagattattc ctggtaaagg aggtagctgt ctccaaaaat 2460
gctattgttg caatatctac attctatttc atattatgaa agaccttaga cataaagtaa 2520
aatagtttat ca                                                     2532
```

<210> 108
<211> 3890
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. J03507

<400> 108
```
atgaaggtga taagcttatt cattttggtg ggatttatag gagagttcca aagttttca 60
agtgcctcct ctccagtcaa ctgccagtgg gacttctatg ccccttggtc agaatgcaat 120
ggctgtacca agactcagac tcgcaggcgg tcagttgctg tgtatgggca gtatggaggc 180
cagccttgtg ttggaaatgc tttttgaaaca cagtcctgtg aacctacaag aggatgtcca 240
acagaggagg gatgtggaga gcgtttcagg tgctttttcag gtcagtgcat cagcaaatca 300
ttggtttgca atggggattc tgactgtgat gaagacagtg ctgatgaaga cagatgtgag 360
gactcagaaa ggagaccttc ctgtgatatc gataaacctc ctcctaacat agaacttact 420
ggaaatggtt acaatgaact cactggccag tttaggaaca gagtcatcaa taccaaaagt 480
tttggtggtc aatgtagaaa ggtgtttagt ggggatggaa aagatttcta caggctgagt 540
ggaaatgtcc tgtcctatac attccaggtg aaaataaata atgattttaa ttatgaattt 600
tacaatagta cttggtctta tgtaaaacat acgtcgacag aacacacatc atctagtcgg 660
aagcgctcct tttttagatc ttcatcatct tcttcacgca gttatacttc acataccaat 720
gaaatccata aaggaaagag ttaccaactg ctggttgttg agaacactgt tgaagtggct 780
cagttcatta ataacaatcc agaattttta caacttgctg agccattctg gaaggagctt 840
tcccacctcc cctctctgta tgactacagt gcctaccgaa gattaatcga ccagtacggg 900
acacattatc tgcaatctgg gtcgttagga ggagaataca gagttctatt ttatgtggac 960
tcagaaaaat taaaacaaaa tgattttaat tcagtcgaag aaaagaaatg taaatcctca 1020
ggttggcatt ttgtcgttaa attttcaagt catggatgca aggaactgga aaacgcttta 1080
aaagctgctt caggaaccca gaacaatgta ttgcgaggag aaccgttcat cagaggggga 1140
ggtgcaggct tcatatctgg ccttagttac ctagagctgg acaatcctgc tggaaacaaa 1200
aggcgatatt ctgcctgggc agaatctgtg actaatcttc ctcaagtcat aaaacaaaag 1260
ctgacacctt tatatgagct ggtaaaggaa gtaccttgtg cctctgtgaa aaaactatac 1320
ctgaaatggg ctcttgaaga gtatctggat gaatttgacc cctgtcattg ccggccttgt 1380
caaaatggtg gtttggctac tgttgagggg acccattgtc tgtgccattg caaaccgtac 1440
acatttggtg cggcgtgtga gcaaggagtc ctcgtaggga tcaagcagg aggggttgat 1500
ggaggttgga gttgctggtc ctcttggagc ccctgtgtcc aagggaagaa aacaagaagc 1560
cgtgaatgca ataacccacc tcccagtggg ggtgggagat cctgcgttgg agaaacgaca 1620
gaaagcacac aatgcgaaga tgaggagctg gagcacttga ggttgcttga accacattgc 1680
```

```
tttcctttgt ctttggttcc aacagaattc tgtccatcac ctcctgcctt gaaagatgga 1740
tttgttcaag atgaaggtcc aatgtttcct gtggggaaaa atgtagtgta cacttgcaat 1800
gaaggatact ctcttattgg aaacccagtg gccagatgtg gagaagattt acggtggctt 1860
gttgggaaa tgcattgtca gaaaattgcc tgtgttctac ctgtactgat ggatggcata 1920
cagagtcacc cccaaaaacc tttctacaca gttggtgaga aggtgactgt ttcctgttca 1980
ggtggcatgt ccttagaagg tccttcagca tttctctgtg gctccagcct taagtggagt 2040
cctgagatga agaatgcccg ctgtgtacaa aaagaaaatc cgttaacaca ggcagtgcct 2100
aaatgtcagc gctgggagaa actgcagaat tcaagatgtg tttgtaaaat gccctacgaa 2160
tgtggacctt ccttggatgt atgtgctcaa gatgagagaa gcaaaaggat actgcctctg 2220
acagtttgca agatgcatgt tctccactgt cagggtagaa attacaccct tactggtagg 2280
gacagctgta ctctgcctgc ctcagctgag aaagcttgtg gtgcctgccc actgtgggga 2340
aaatgtgatg ctgagagcag caaatgtgtc tgccgagaag catcggagtg cgaggaagaa 2400
gggtttagca tttgtgtgga agtgaacggc aaggagcaga cgatgtctga gtgtgaggcg 2460
ggcgctctga gatgcagagg gcagagcatc tctgtcacca gcataaggcc ttgtgctgcg 2520
gaaacccagt aggctcctgg aggccatggt cagcttgctt ggaatccagc aggcagctgg 2580
ggctgagtga aaacatctgc acaactgggc actggacagc ttttccttct tctccagtgt 2640
ctaccttcct cctcaactcc cagccatctg tataaacaca atcctttgtt ctcccaaatc 2700
tgaatcgaat tactcttttg cctccttttt aatgtcagta aggatatgag cctttgcaca 2760
ggctggctgc gtgttcttga aataggtgtt accttctctg ggccttggtt ttttaaaatc 2820
tgtaaaatta gaggattgca ctagagaaac ttgaatgctc cattcaggcc tatcattta 2880
ttaagtatga ttgacacagc ccatgggcca gaacacactc tacaaatga ctaggataac 2940
agaaagaacg tgatctcctg attagagagg gtggtttcc tcaatggaac caaatataaa 3000
gaggacttga acaaaaatga cagatacaaa ctatttctat cctgagtagt aatctcacac 3060
ttcatcctat agagtcaacc accacagata ggaattcctt attcttttt taatttttt 3120
aagacagagt ctcactttgt tgcccaggct ggagcgcagt ggggtgatct catctccctg 3180
caacctccgc ctcctgggtt gaagcgattc ttgtgcctca gcttcccaag cagctgggat 3240
tacaggtgcc cgccaccacg cccagctaat ttttgcattt ttagtagaga tgggtttcac 3300
catgttggcc atgctcgtct ccaactcctg acctcaggta atccgtctgc cttggcctcc 3360
caaatgctgg gattacagac atgaaccacc acgcctggct ggaatactta ctcttgtcgg 3420
gagattgaac cactaaaatg ttagagcaga attcattatg ctgtggtcac aggggtgtct 3480
tgtctgagaa caaatacaat tcagtcttct ctttgggtt ttagtatgtg tcaaacatag 3540
gactggaagt ttgcccctgt tctttttct tttgaaagaa catcagttca tgcctgaggc 3600
atgagtgact gtgcatttga gatagtttc cctattctgt ggatacagtc ccagagtttt 3660
cagggagtac acaggtagat tagtttgaag cattgacctt ttatttattc cttattttct 3720
tttcatcaaa acaaaacagc agctgtggga ggagaaatga gagggcttaa atgaaattta 3780
aaataagcta tattatacaa atactatctc tgtattgttc tgaccctggt aaatatattt 3840
caaaacttca gatgacaagg attagaacac tcattaagat gctattcttc              3890
```

<210> 109
<211> 2941
<212> DNA
<213> Homo sapiens

<220>
<223> Genbank Accession No. K01383

<400> 109

```
gaattcatgc ttggactaca gcttcccgcc acctccccca tcttgctttt tagtttaaag 60
cagggtcagc acatcacatg aagtcatctc cttttaggg gatatcccac atgccaagac 120
taccaagcgg tagggggtg gccggctagg ctgtggggag cacggagatt tatttgcaaa 180
ggaggaccta gacaaaagag cccccacatc ctctcaggcg aggagaatgg acgagagtga 240
gaggccgacc cgtgttcccg tgttactgtg tacggagtag tgggtccgag ggacctaggt 300
gtggacaggg acaggcaagg cgacagcgag gagaaacgaa aatcacatcg gtggcggttg 360
ctctgcacac aaactccgct cgctaccgca cgctccacgc tctgcactac gccgaccggg 420
gacaggagca ggaggctgtg gctgcactca gacttcggga caggccgagc tgaaaaccgt 480
gagaggggtg gggtggaggc gaccgaaacg ccaaggctgg gttcccggaa cgcgcggga 540
ccagggtgga aggcaacttc ggggaaacgg gaaaggcgac cgggacctcg gggacgcccc 600
gtaccccggg cgtaaactca ctcccgcgtt agcgggcgcc aaagcgggga ggggtggtc 660
ccgtggtccg cacccagggg agctcagtgg actgtgcgcc ttgcctttct gctgcgcaaa 720
gcccagtcca ggtcatcacc tcgggcgggg cggactcggc tgggcggact cagcggggcg 780
ggcgcaggcg cagggcgggt cctttgcgtc cggccctctt tcccctgacc ataaaagcag 840
```

```
ccgctggctg ctgggcccta ccaagccttc cacgtgcgcc ttatagcctc tcaacttctt 900
gcttgggatc tccaacctca ccgcggctcg aaatggaccc caactgctcc tgcgccactg 960
gtaagggatg ctaggtttct ggtccttagg atacctattt ccccgccaca ggatagatgt 1020
ccctaggagt agaggtgttt tttgagttct agctaagtgg agtcatttat ttcattgatc 1080
tagtgctttt ccactcagcg ccttcatcat ccctagaaca ttcctattct aatgcctccc 1140
atttcgagag gcgagaggac tcaggctcat aattctcctg ctccatgtca cccaggtagt 1200
cggggactgc tagctgagcc ccagtactct gcgcagttcc tgggcggatg ggcgacacgg 1260
acttattggt ttttcgggat taaggacata agcccatcct agcctctaca gatagaagta 1320
agattagctt catgtgccct gagttggaca ggagctatct atcaggcctg gcaatgcact 1380
cagctggcag catttgttga ccaactgctg ttatcttctg tgtaaagttc actgcctttt 1440
tctcttcctt gcaggtggct cctgcacctg cactggctcc tgcaaatgca aagagtgcaa 1500
atgcaactcc tgcaagaaga gtgagtgcgg ggccatctct aggaactggg gctgagccaa 1560
gtcagaggca ggaaaccaga gctgggctag gaggagtagg ccaatgatcc atttcccaca 1620
tcccttccca gcaactgatt caggatcaga gccagatctt tagacgtgat ggattcccaa 1680
gtttcgttct taaaatagac aaactgaggc caagagagtg caccaaccta ccaaacacaa 1740
acatgacacc taaggacttt cctcccctaa gtgtgtggtt ctggggagcc agccttcctt 1800
tgtccttcta accccagtca ctgcctttcc agccttctgc caggtctggg gctcagatgg 1860
agataagctt ttcacagaag accctcactc gaaagatcca ccactatct cccatctccg 1920
acagtgcatg ccatcctgaa ctaagtgtcc tctggggctg gggacagagc ttgggccagg 1980
cttctctggg ggcagggaag tcccggtcaa gtctagtctg acctctcact ctcccttctt 2040
ccccaggctg ctgctcctgc tgccccatga gctgtgccaa gtgtgcccag ggctgcatat 2100
gcaaaggggc atcagagaag tgcagctgct gtgcctgatg tccggacagc cctgctcgaa 2160
gatatagaaa gagtgacctg cacaaacttg gaattttttt tccatacaac cctgacccat 2220
ttactgtatt ttttttaatg aaatatgtga atgataataa aagttgctga cttaatggtg 2280
gctctggttt tctttgtgtg ccttgaaata agggaccata caacagagct gggatggtgg 2340
attgcattga gagtcagaga cctgggtgct gggaccttgt gctattatct tacacactgg 2400
aggcctgtta aggcaaatca ggtactcgcc tcaggtcagt ttcttaaata aaaatgtaag 2460
agcgtgatga cagatgatat aatgccacag gaatctgtca cagacttaag ctttggtaag 2520
ataaaatcta ttagtatgac aaaaaaaaac accaaatcca ttttttatat tgaacaggac 2580
aatttcagta aatatatgga agacaagata ggaaaaataa aattacacta cacatttgtt 2640
ctggatgtat attcagactt ggaaacagtt cacagactgg ccccagtatg tgggtcacac 2700
accttcaaca ccagccaaga catccccaca tggaaccatc agtcttggcc tgtccaggtc 2760
actgatgtga tacttggtat ctctgagagc tccatgttgt gacttgtctc tgaatcttcg 2820
gaagtttctc cctaggtcat gctgaaatcc gttcctcctc aagtccagcc cttggttaat 2880
tcaggcaagc aaagtgactg ggggagtggg ggaaattacc caggatcctc ccagcaagct 2940
g                                                                 2941
```

(54) Title: GENE EXPRESSION PROFILES IN LIVER DISEASE

(57) Abstract:

PATENT COOPERATION TREATY

PCT

DECLARATION OF NON-ESTABLISHMENT OF INTERNATIONAL SEARCH REPORT

(PCT Article 17(2)(a), Rule 13*ter*.1(c) and 39)

Applicant's or agent's file reference 44921-5109WO	**IMPORTANT DECLARATION**	Date of mailing (day/month/year) **0 4 JUN 2003**
International application No. PCT/US02/40718	International filing date *(day/month/year)* 20 December 2002 (20.12.2002)	(Earliest) Priority date *(day/month/year)* 21 December 2001 (21.12.2001)

International Patent Classification (IPC) or both national classification and IPC

IPC(7): A01N 37/18, 43/04; C12P 19/34; C12M 1/34; C12Q 1/68; G01N 33/00, 33/566 and US Cl.: 435/4,6,91.2, 287.2; 436/501, 94; 702/19; 514/2, 44

Applicant

GENE LOGIC, INC.

This International Searching Authority hereby declares, according to Article 17(2)(a), that no **international search report will** be established on the international application for the reasons indicated below.

1. ☐ The subject matter of the international application relates to:
   - a. ☐ scientific theories.
   - b. ☐ mathematical theories
   - c. ☐ plant varieties.
   - d. ☐ animal varieties.
   - e. ☐ essential biological processes for the production of plants and animals, other than microbiological processes and the products of such processes.
   - f. ☐ schemes, rules or methods of doing business.
   - g. ☐ schemes, rules or methods of performing purely mental acts.
   - h. ☐ schemes, rules or methods of playing games.
   - i. ☐ methods for treatment of the human body by surgery or therapy.
   - j. ☐ methods for treatment of the animal body by surgery or therapy.
   - k. ☐ diagnostic methods practised on the human or animal body.
   - l. ☐ mere presentations of information.
   - m. ☐ computer programs for which this International Searching Authority is not equipped to search prior art.

2. ☐ The failure of the following parts of the international application to comply with prescribed requirements prevents a meaningful search from being carried out:
   - ☐ the description ☒ the claims ☐ the drawings

3. ☐ The failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions prevents a meaningful search from being carried out:
   - ☐ the written form has not been furnished or does not comply with the standard.
   - ☐ the computer readable form has not been furnished or does not comply with the standard.

4. Further comments:
Please See Continuation Sheet

Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230	Authorized officer Bradley L. Sisson Telephone No. (703) 308-0196

Form PCT/ISA/203 (July 1998)

4. Further comments:

The claimed methods, compositions, solid suports, and computer systems all require the use of the "at lest one gene in Table 1." A review of Table 1, pages 35-42 of the disclosure, finds a listing of various nucleic aicd "fragments" by name, SEQ ID NO., etc. A review of the associated Sequence Listing finds that none of the disclosed "genes" are in fact any gene. All of the sequecnes disclosed are nucleic acid in composition, thereby precluding any meaningful search for polypeptides or functional frgments thereof. The nucleic acid sequcnes discloed are incapable of encoding any polypeptide as they (1) lack any promoter; (2) lack a start site; (3) lack a stop codon; and/or (4) are out of reading frame. While some claims are directed to methods and compositions of the genes or functional fragments thereof, the disclosure does not identify which, if any fragment, is useful or what the desired function is. Accordingly, no meaningful search can be established.